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ADTC-TR-76-89

F-111 Munitions Compatibility Flight Test Program (Phase II)

(SEEK EAGLE)

TECHNICAL REPORT ADTC-TR-76-89

OCTOBER 1976

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3246TH TEST WING

ARMAMENT DEVELOPMENT AND TEST CENTER

AIR FORCE SYSTEMS COMMAND • UNITED STATES AIR FORCE

EGLIN AIR FORCE BASE, FLORIDA

This technical report is approved.

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F-111 aircraft	AIM-9J missile	
Pivot pylon	BDU-33 practice bomb	CBU-24 cluster bomb
SEEK EAGLE	BLU-1C/B firebomb	

(Continued)

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Testing was conducted to verify satisfactory fit, carriage, and release of munitions from the F-111 aircraft. The munitions were fit checked in various configurations to verify physical fit and electrical compatibility. They were then flown on extended captive flights to insure that aircraft handling qualities were not degraded and/or to verify the integrity of the munition/aircraft configuration. Finally, as appropriate, the munitions

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Block 19 (Continued)

M117 GP bomb
MK 82 GP bomb
MK 84 GP bomb
MK 84 laser guided bomb (LGB)
MK 106 practice bomb
2.75-inch folding-fin aircraft rocket (FFAR)
SUU-20 aircraft dispenser
SUU-21 aircraft dispenser
CBU-30/A weapon
CBU-38B/A weapon
600-gallon fuel tank
Fixed pylon
B-43 vibrational fly around unit
B-57 vibrational fly around unit
B-61 Vibrational fly around unit
B-43 tail can loads unit
BDU-8
MK 82 SE bomb
CBU 58 cluster bomb
BLU-49 dunnage
QRC-335
T-lug
MK 20 (Rockeye)

Block 20 (Continued)

cont.

were released at predetermined airspeed, dive angle, altitude, and wing sweep angles to verify safe separation throughout the aircraft/munitions envelope. The data from the completed tests were then analyzed and recommendations for certification forwarded to the F-111 system program office (SPO) for use in publication of the applicable handbooks. This report does not repeat all certification information, but provides configuration and mission summaries and elaborates on the various test problem areas encountered.

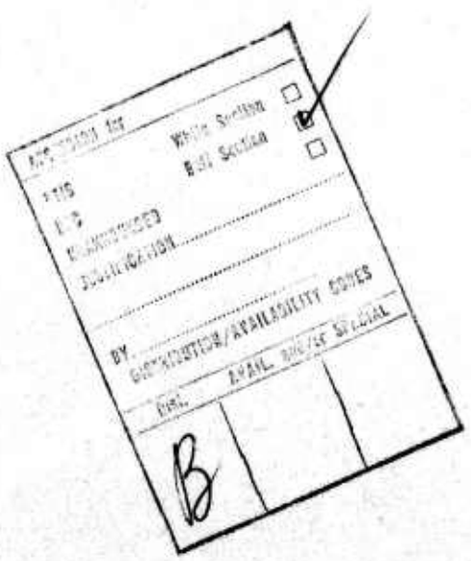
PREFACE

F-111 SEEK EAGLE testing, Test Directive 324AWB00 (324AZ005), is being conducted in response to ASD (ASLT) letter, "SEEK EAGLE," 18 July 1968; and Project Management Directive (PMD) R-Q2-116-(2), 20 July 1972. This interim report covers testing from 1 July 1973 to 30 June 1976.

ADTC personnel responsible for testing and report preparation were:

F-111 Flight Test Program Manager	A. J. Bianco, Maj, USAF
Compatibility Engineer	D. A. Vore, Capt, USAF
Munitions Test Engineer	R. M. Senko, Maj, USAF

Data from the completed tests were published in six separate data packages and have been incorporated in the applicable technical orders (TO). (See the appropriate data packages for the personnel responsible for each test.) Four of the tests are ongoing, and separate data packages will be published at test conclusion.



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CONTENTS

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SECTION I

INTRODUCTION

The purpose of this interim test report is to provide a summary of the test results of Test 324AWB00 (324AZ005), F-111 (SEEK EAGLE), from 1 July 1973 to 30 June 1976. The results of the continuing program will be reported periodically.

For effective test management and reporting, Test 324AWB00 was separated into smaller test segments. As each test segment was completed, a detailed data package was prepared and submitted.

ADTC-TR-73-72, F-111 Munitions Compatibility Flight Test Program Phase I (SEEK EAGLE), Unclassified, October 1973, AD 914280, covers F-111 SEEK EAGLE testing from the beginning on 27 May 1969 to 30 June 1973, including the following test/data package numbers:

1. 324AZ05A/No. 2, Compatibility Test of the BRU-3A/A Rack with the M117 with MAU-103A/B Tail Fin, M117R, MK 82, MK 82 SE, and the CBU-24/B on the F-111

2. 324AZ05B/No. 1, Compatibility Test of the SUU-20A/A Dispenser with BDU-33A/B, MK 106, and 2.75-Inch Rockets on the F-111A

3. 324AZ05C/No. 7 (73-3), Compatibility Test of MK 82, MK 84, M117, and CBU-24/B on the F-111A and F-111E

4. 324AZ05D/No. 3, Compatibility Test of the SUU-21/A on the F-111E

5. 324AZ05E/No. 4, Compatibility Test of the SUU-20B/B with the Speed Brake Out on the F-111E

6. 324AZ05G/No. 8 (73-13), Compatibility Test of the BLU-1C/B (Finned and Unfinned) on the F-111E

7. 324AZ05J/No. 6, Compatibility Test of the MK 84 LGB (GBU-10A/B) on the F-111E

This report will summarize the following work directives/SEEK EAGLE data packages:

1. 324AZ05K/No. 9, Compatibility Test of the CBU-30/A and CBU-38B/A Weapon

2. 324AWG02 (324AZ05M)/No. 10, Compatibility Test of Empty 600-Gallon Fuel Tank and Fixed Pylons on the F-111 Aircraft

3. 324AWG04 (324AZ05P)/No. 11, F-111 Weapons Delivery Accuracy

4. 324AWG01 (324AZ05L)/No. 12, BRU-3/MK 82 Arming Wire Investigation (Phase I)

5. 324AWG01 (324AZ05L)/No. 13, BRU-3/MK 82 Wire Investigation (Phase II)

6. 324AWG07/No. 14, BRU-3A/A 100 Percent Strength Test.

This report will also summarize the status of the following ongoing work directives as of 1 June 1975:

1. 324AWG01 (324AZ05L), Compatibility Test of the MK 82 SE/BRU-3/A Arming and Fin Release Wire Configuration on the F-111E Aircraft (Final Phase)

2. 324AWG03 (324AZ05N), F-111 Nuclear SEEK EAGLE

3. 324AWG05 (324AZ05Q), Compatibility Test of AIM-9J Missile on F-111 Aircraft

4. 324AWG06, Compatibility Test of the MK 20 (Rockeye) on the F-111 Aircraft.

The mission summary in this report includes all missions flown on Test 324AWB00 (324AZ005) from the start of testing until 30 June 1976. It also includes missions flown on several other tests which involved munitions compatibility with the F-111. The test numbers and their associated reports (if available) are as follows:

1. 670AY098; ADTC-TR-71-55, Test of High Density Bombs (BLU-58/B) on the F-111 Aircraft, Unclassified, April 1971, AD 883 649

2. 324AY019, Compatibility Test of 600-Gallon Tanks on the F-111 Aircraft

3. 5064W001; ADTC-TR-74-19, Supersonic Weapons Separation from F-111 Aircraft (M117 Bluff Bomb), Unclassified, April 1974, AD 918 844L

4. AFATWG01; ADTC-TR-74-99, Aerodynamic Heating Test of Aircraft Racks and Pylons, Unclassified, October 1974, ADB000049L; and AFATL-TR-76-31, Aerodynamic Heating of Aircraft Racks and Pylons, Unclassified, July 1976, ADB012831L

5. 5013W001; ADTC-TR-74-106, Supersonic Delivery of Conventional Munitions by F-4 and F-111 Aircraft (U), CONFIDENTIAL, November 1974, ADC000405L

6. 3169WC02; ADTC-TR-76-42, Test of the Production Engineering Program GBU-10C/B and GBU-12B/B Laser Guided Bombs (U), SECRET, July 1976

7. ADTCWC13, FMU-110 Production Evaluation Test

8. 5974WC02, Evaluation of Pilot Production of GBU-2/B Cluster Bombs.

The specific objectives of the F-111 flight test program are to demonstrate compatibility of the selected munitions with the F-111 aircraft in the following areas:

1. Physical and electrical compatibility

2. Captive carriage

3. Safe separation

4. Ballistic data acquisition (as appropriate).

This report provides a general overview of the test items, test method, and test results. More detailed information about the tests is contained in the individual data packages which are maintained at ADTC (DLJ), Eglin AFB, Florida. Results of these certifications are included in Section V of the applicable Dash 1 for each Model Design Series aircraft.

Unless otherwise indicated in this report, the munition/configurations listed above were found acceptable for fit, carriage, and release from the aircraft.

SECTION II

DESCRIPTION

F-111 AIRCRAFT

The F-111 is a swing-wing, twin-jet, ground attack fighter-bomber utilized specifically for precision weapon delivery. The armament consists of external stores carried on eight wing-station pylons utilizing cartridge ejection bomb racks and an internal weapons bay which is capable of carrying a variety of weapons. The aircraft has the capability of varying the wing sweep angle from 16 to 72.5 degrees. The two inboard pylons on each side of the aircraft pivot with the wing and allow carriage of weapons throughout the aircraft envelope. The outer two pylons on each wing will not pivot and are limited to wing sweeps of 26 degrees or less.

A detailed description of the aircraft used in this test is contained in TO 1F-111A-1. The test aircraft have been modified for a capability of onboard photographic coverage using seven cameras mounted permanently on the aircraft. These cameras provide views of the wing stations from the nose, wingtip, and aft fuselage areas of both sides of the aircraft. In addition, an under-the-nose camera gives a view of munitions falling away from the underside of the aircraft. This camera system also includes a coding system whereby elapsed time may be encoded onto the film.

MUNITIONS

Munitions used in these tests were inert versions of DOD weapons. In all cases, the mass properties of the munitions were measured to insure they were near perfect facsimilies of standard live items.

Detailed descriptions of items used for the F-111 SEEK EAGLE tests are contained in TO 1F-111A-34-1-1. Nomenclature of the components of the specific test items is contained in the appropriate data package. For non-F-111 SEEK EAGLE tests refer to the appropriate report for details on specific test items.

For the captive fly around flights, actual nuclear shapes (B-43, B-57, B-61) were modified by Sandia Laboratories with an array of sensors to sample the inflight vibration environment at various weapon stations on

the F-111 aircraft. A B-43 unit was modified to ascertain the loads encountered by the B-43 tail can in the weapons bay with the bay doors open. The modifications included the capability to telemeter all data to the ground, and no onboard recording capability was required. All modifications to the shapes were internal. Further detailed information on these items can be provided by Sandia Laboratories/4312, Albuquerque, New Mexico.

SUSPENSION EQUIPMENT

The MAU-12C/A bomb ejector rack is designed as an internal installation within the pivot or fixed pylons of the F-111. The rack will carry and forcibly eject rack mounted stores, multiple or triple ejector racks, or rocket launchers, at both high and low airspeeds.

The triple ejector rack (TER) provides carriage and individual launch (or jettison) capabilities for a variety of conventional stores and mates to the MAU-12 bomb rack at all pylon stations.

The BRU-3A/A bomb rack is a multiple-type rack which provides for carriage and individual release and ejection of as many as six stores. Loading on the BRU-3A/A requires T-lugs in place of the more common bale lugs.

The AERO-3B guided missile launcher is a streamlined launcher assembly which incorporates the necessary power supply, wiring, and rail assembly to fire the AIM-9 Sidewinder missile. The AERO-3B launcher can be attached to the bottom of the pivot pylons and to the outboard side of the outboard pivot pylons.

A detailed description of the suspension equipment is contained in the appropriate Dash 34 handbook.

SECTION III

TEST PROCEDURES AND RESULTS

FIT CHECKS

Fit checks were conducted in accordance with procedures outlined in MIL-STD-1289, 31 October 1972. Critical fit areas were predetermined, and selective configuration loading was utilized to check the store-to-store and store-to-aircraft clearances. This method reduced the number of munitions that were required to be loaded for each fit check; however, sufficient munitions were loaded in each configuration to verify standard Air Force or ADTC munitions test loading checklists.

Fit for all configurations was satisfactory except for discrepancies discussed in the following paragraphs.

CBU-30/A (CBU-38B/A). The fit check revealed that the 8-inch retention cable supplied for the CBU electrical harness was too short and prevented an aircraft electrical hookup prior to weapon lockup (Figure 1). The only means of utilizing the 8-inch retention cable was to first lock in the weapon, then remove an access panel (16 screws) on the pylon, complete the electrical hookup, and finally replace the access panel (16 screws). The objections to this were: (1) a minimum of 30 minutes would be added to the load time, (2) there was an excellent chance of stripping access panel screws and thereby adding even more to the load time, and (3) standard load procedures are to make the electrical hookup prior to weapon lockup. Longer retention cables (12 inches) were manufactured by the Field Maintenance shops for test purposes. A retention cable of at least 12 inches in length is required to complete the aircraft-to-weapon electrical hookup (Figure 2).

MK 20 ROCKEYE. The fit check revealed that the bombs could not be loaded on the shoulder stations of the BRU-3A/A rack. The tail fin contacted the rack before the weapon locked in. To obtain the proper clearance (Figure 3), the rear T-lug was backed off one turn after it was installed in accordance with TO 11A-1-37.

The fit check also revealed that there was no provision for securing the tail fin release wire in order to insure positive fin opening. Positive tail fin opening is required because the weapon is unstable in flight with the fins retracted. Normally, the fin release wire is securely attached

to the sway brace on other racks; however, the BRU-3A/A has no sway braces or any other protrusion that could provide a secure attaching point. ADTC Air Force Armament Laboratory engineers designed, analyzed, and procured a positive tail fin opening device. This device was installed on the outside skin of the BRU-3A/A rack over the tail arming solenoid using the solenoid screws (Figure 4). The Rockeye tail fin arming loop was installed in the device on a subsequent fit check to verify mechanical compatibility (Figure 5).

CAPTIVE COMPATIBILITY FLIGHTS

Captive compatibility flights were conducted in accordance with local test procedures.[1] In general, captive compatibility flights consisted of two sorties flown back-to-back without downloading or adjusting the munition between sorties.

The first sortie of a captive compatibility flight typically included the following maneuvers:

1. A full control deflection sideslip to check directional stability

2. A pitch doublet: Push-pull ±1 G to check longitudinal stability

3. A rudder doublet: Equal amounts of each rudder with hands off the stick to check lateral and directional stability

4. A roll at maximum allowable rate of roll to check roll performance

5. Pullups, pushovers, inverted turns, and rolling pullups to maximum specified G loads.

The preceding evaluations were conducted at various selected speeds and at selected wing sweep angles. In addition to these maneuvers, the pilot evaluated the stability during acceleration to the next speed, trim changes required when the speed brakes were extended, and slow speed and landing handling characteristics. For all maneuvers, the pilot made a qualitative evaluation of the aircraft/munition combination handling characteristics.

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[1] 3246th Test Wing Regulation 55-1, 13 January 1976.

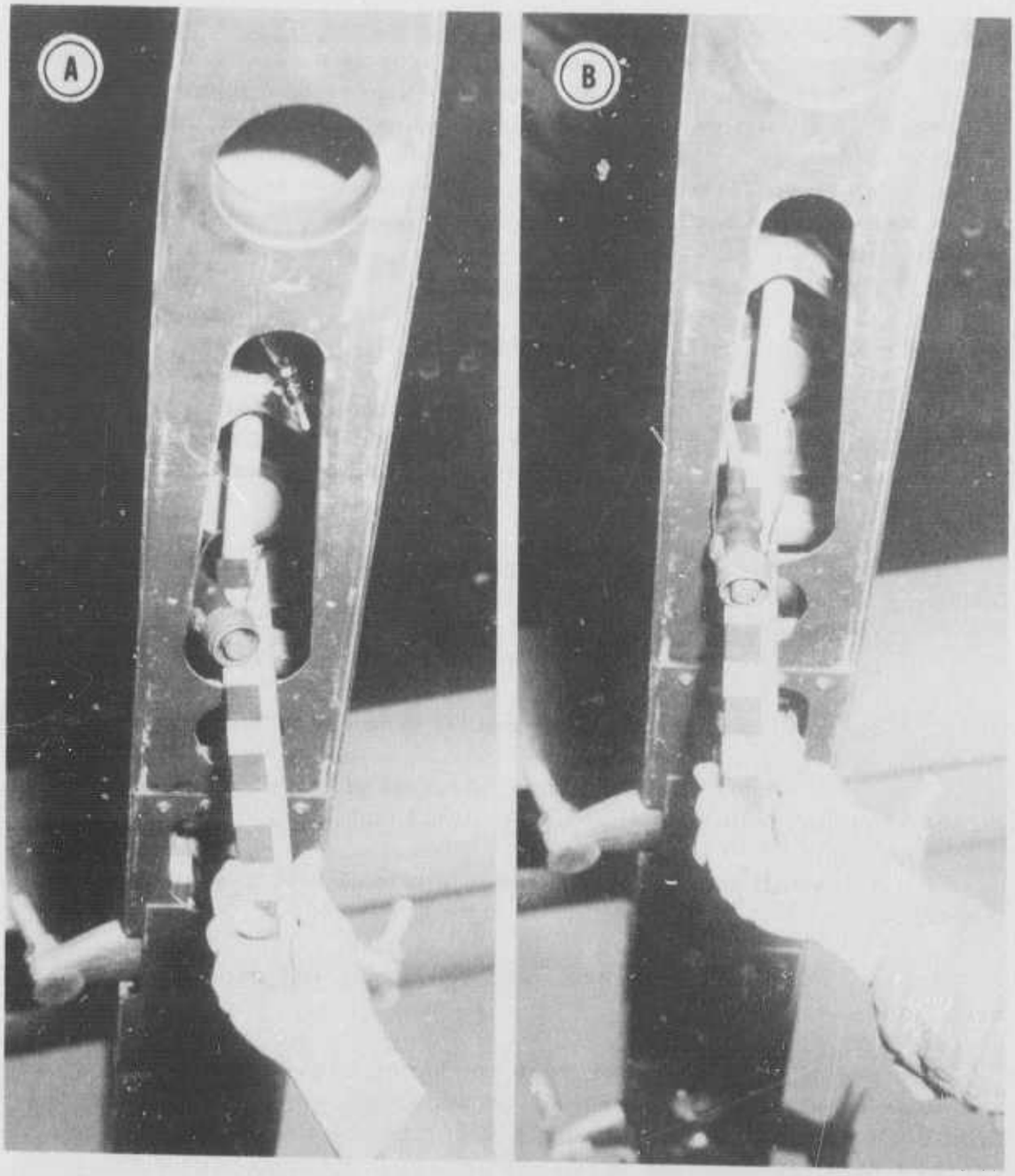

Figure 1. CBU-30/A (CBU-38B/A) electrical harness in pivot pylon, showing (A) supplied harness with 8-inch retention cable and (B) modified harness with 12-inch retention cable

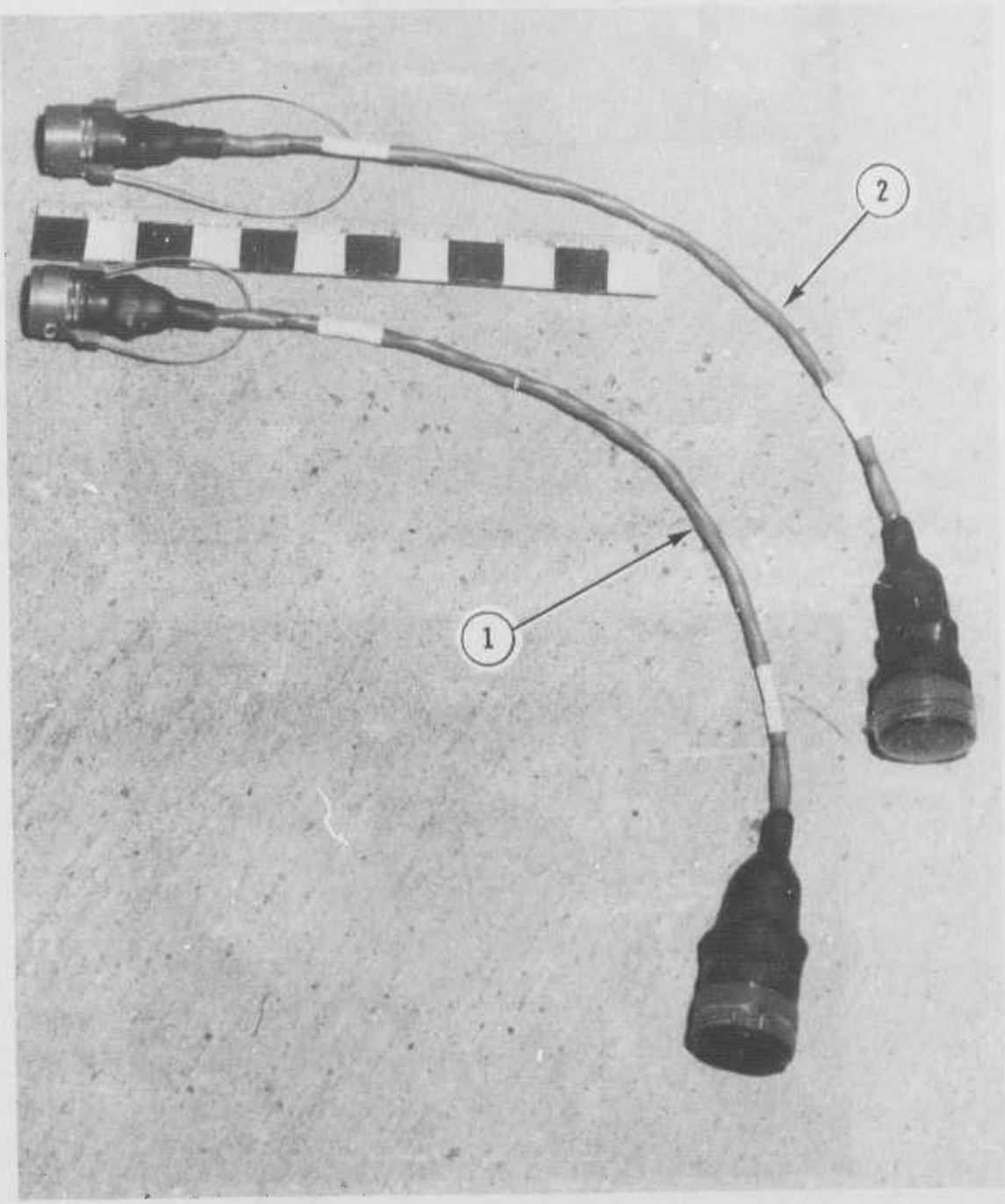

Figure 2. Comparison view of CBU-30/A (CBU-38B/A) harness, showing (1) supplied 8-inch retention cable and (2) modified 12-inch retention cable

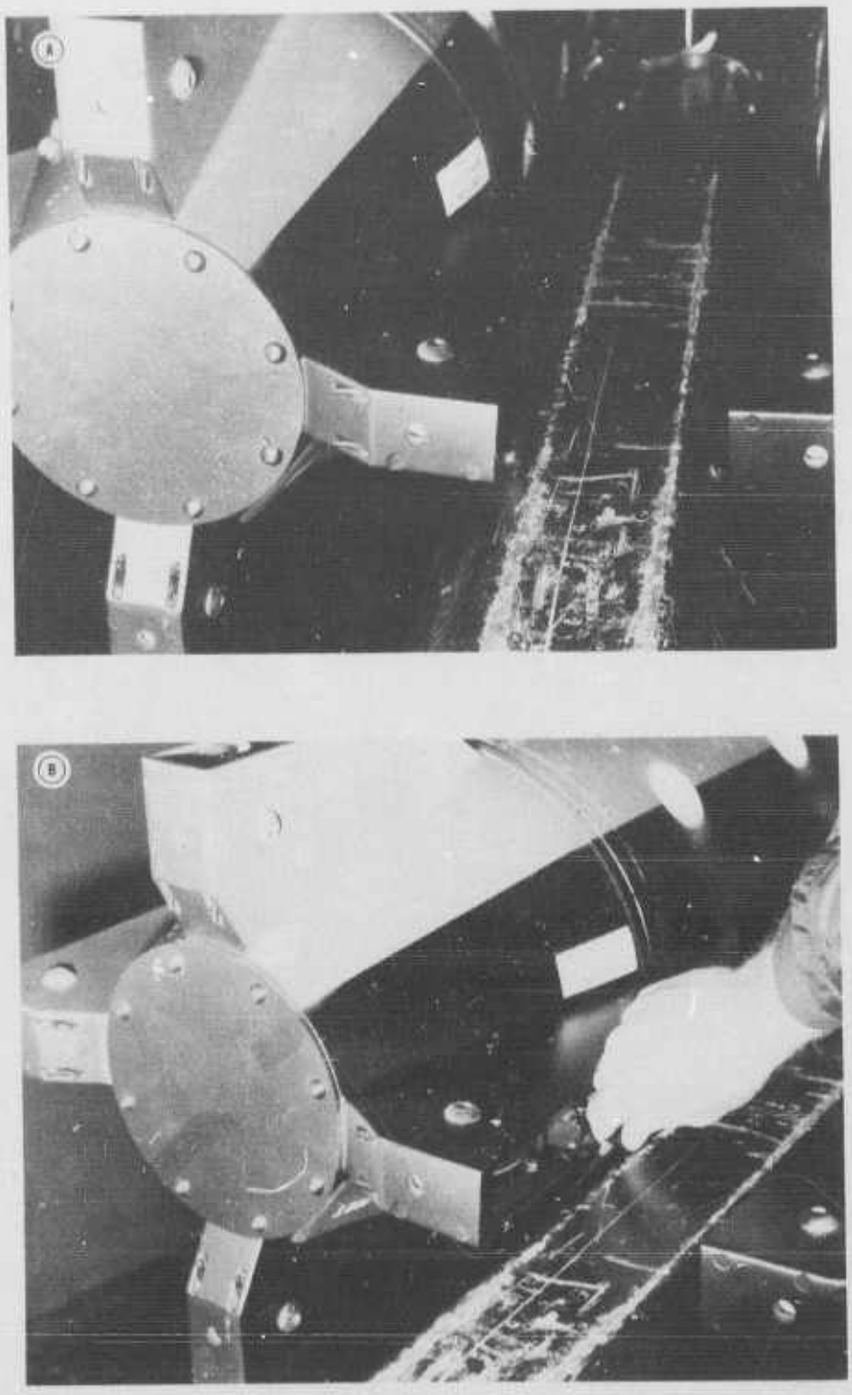

Figure 3. MK 20 (Rockeye) on forward station of the BRU-3A/A rack showing tail fin clearance, with aft T-lug (A) installed in accordance with TO 11A1-1-37 and (B) backed out one turn

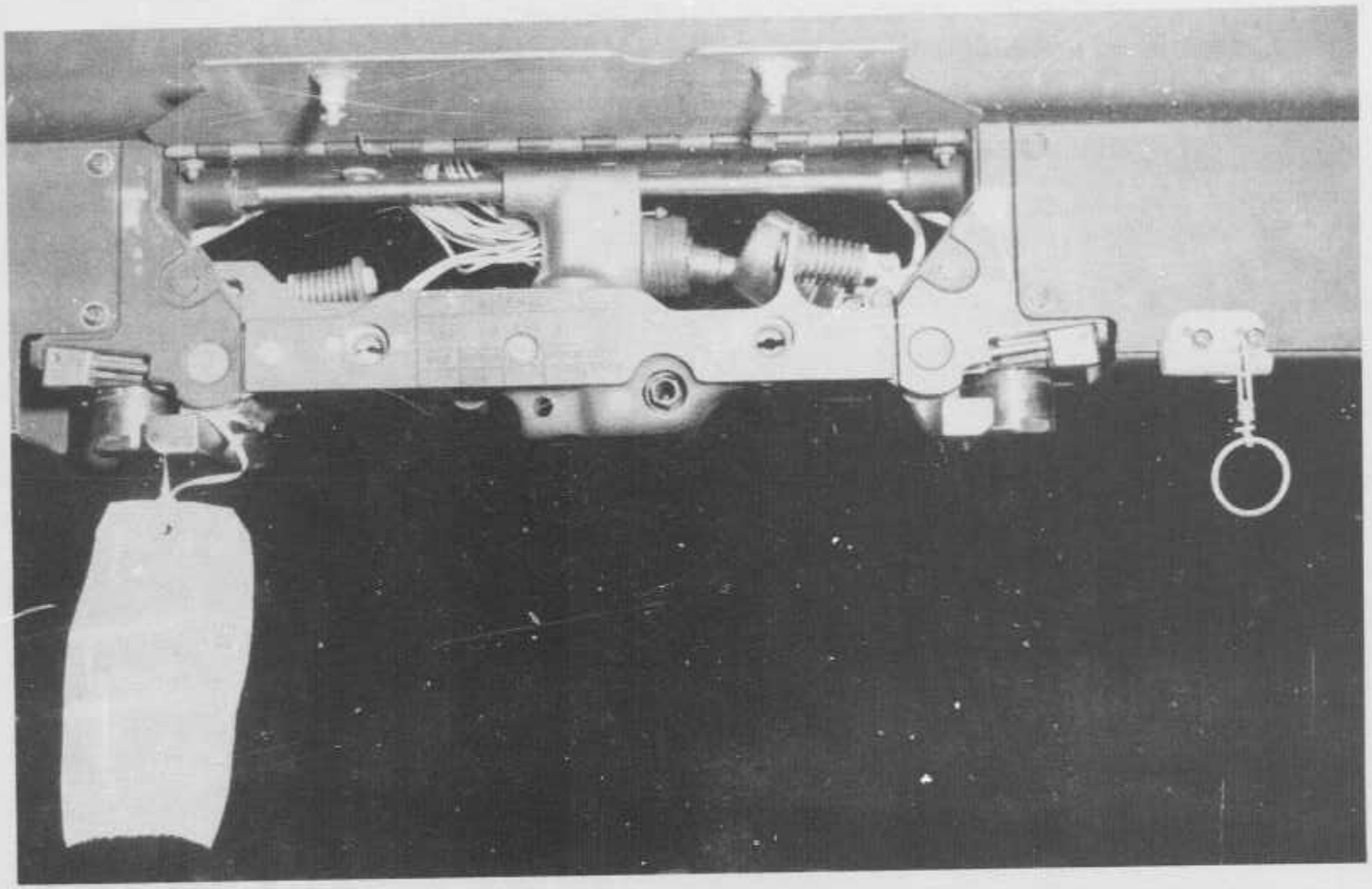

Figure 4. BRU-3A/A rack with the positive tail fin opening device installe over the tail solenoid (a swivel and link assembly is inserted in the device)

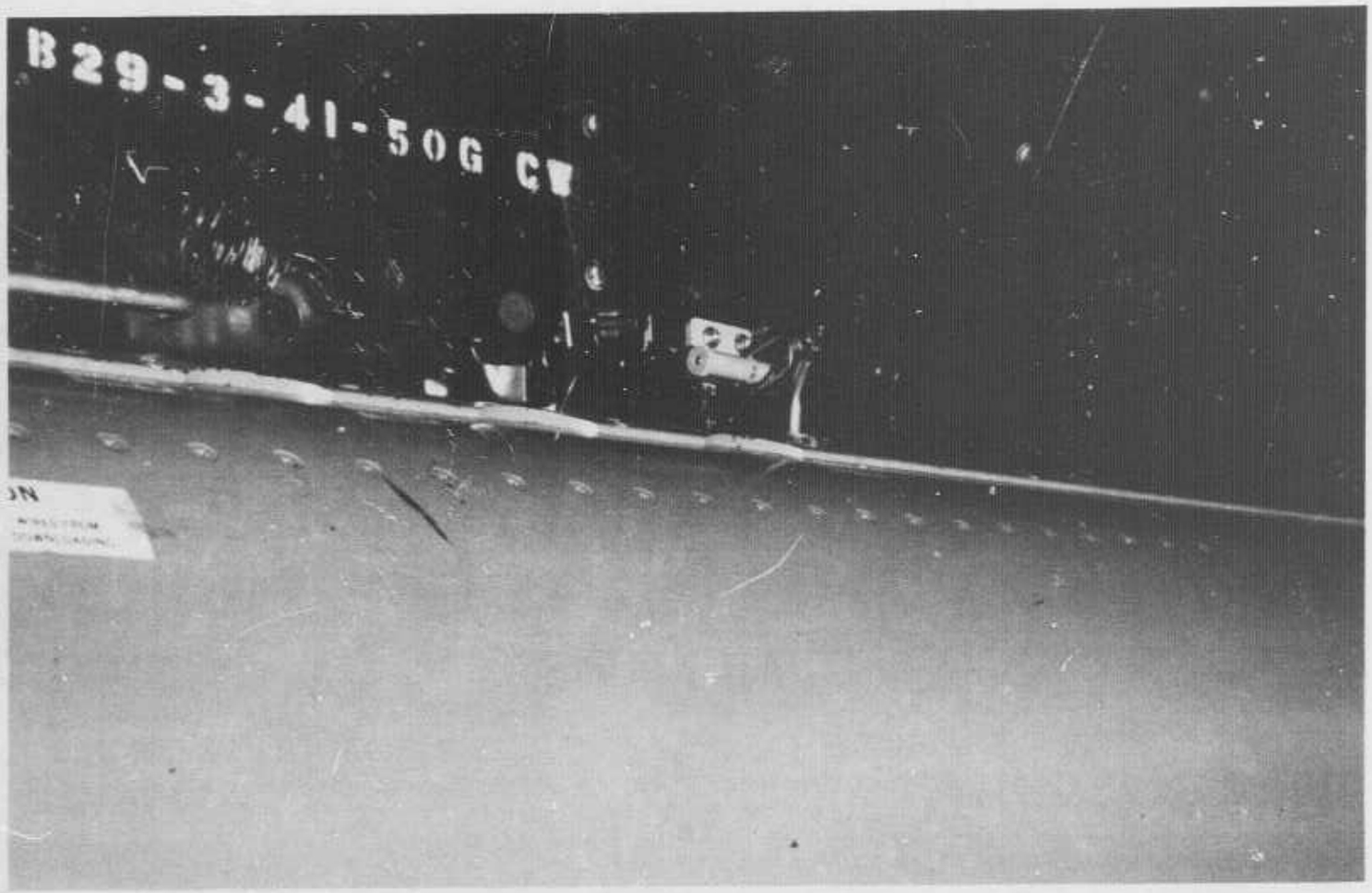

Figure 5. MK 20 installed on the BRU-3A/A rack with tail fin arming lanyard installed in the positive tail fin arming device

The second sortie was accomplished to subject the aircraft/store loading to sustained flight (25 to 30 minutes) at the maximum allowable airspeed for the configuration and to insure that the duration of the captive compatibility flight was representative of the operational environment of the configuration.

Table 1 shows the various munition configurations tested. Not all configurations shown were flown on captive flights; however, a representative loading (or loadings) of each munition was subjected to the complete two-part mission. The mission summary (Table 2) indicates which munition/aircraft configurations were flown on captive flights. Anomalies that were discovered during captive flights or during postflight inspection following captive flights are discussed in the following paragraphs.

CBU-30/A (CBU-38B/A. Captive carriage of this weapon revealed negative dihedral (C_{L_β}) characteristics for airspeeds above 0.8 mach for 26-degree wing sweep, and 0.85 mach for 35-degree wing sweep (mission 72-13). Based on the negative dihedral characteristics, the F-111 test pilot recommended a 0.80-mach limit for 26-degree wing sweep, and a 0.85 mach limit for 35-degree wing sweep.

AIM-9J. Postflight inspection after the third captive compatibility flight (mission 74-39) revealed the following failures:

1. Five of 16 rollerons were uncaged (Figure 6)

2. All rolleron uncaging forces were above the maximum limits

3. All four guidance and control units had sealant leaking and subsequently failed postflight checkout (Figure 7).

The missile failures were not peculiar to the F-111 flight environment, but had been discovered also during flight testing on other fighter aircraft. This testing was suspended awaiting availability of improved components.

CBU-58. Captive carriage of this weapon above 0.90 mach revealed a 3-Hz yaw oscillation of the BRU/store combination at speeds from 0.92 mach to 0.94 mach (missions 74-46 and 74-50). The oscillations were not noted above 0.94 mach. On postflight inspection, several tail fins had loose bolts and corner cracks, and several nose fuzes had worked loose. Further details on this problem are discussed in ADTC-TR-74-106.

MK 82 SE. The current MK 82 SE arming wire configuration requires the use of 0.063-inch stainless steel arming wire to arm the tail fin. Because the fin must be armed at a safe distance from the aircraft, an excessive length of the wire trails out behind the bomb in flight. This length of wire is sufficient to flail about and damage the racks and pylon prior to release. After release, it remains with the rack, and since it is not restrained, it fails more severely. This causes damage to the underside of the wing, and the rack and pylon. A second problem comes from the angle induced in the wire as it pulls out of the tail fin band. As the bomb travels down away from the rack, the induced angle becomes larger, and the load on the wire causes the wire to fail prior to tail fin arming.

To eliminate these problems, stranded stainless steel cable was employed. This stranded cable was stowed on the side of the fin during flight and was designed to be as inexpensive as possible through the use of existing hardware. Several configurations were flown on captive flights, but the environment of the aircraft was so severe that all failed (Figure 8). Since the lanyard could not survive flight simply tacked to the side of the bomb, a method of containing the wire in a rectangular tube was tested for static ejection and is now in flight testing.

BRU-3A/A 100-PERCENT STRENGTH. During the demonstration of the maximum roll rates of 100 degrees per second for configurations 1 and 29, respectively, a store oscillation was encountered. While attempting 100-degree per second roll rates, very severe oscillations were encountered on mission 75-26 during a 360-degree roll. Flight conditions were 440 KCAS, mach 0.78, 9,000 feet MSL, wing sweep 26 degrees, 80 degrees per second roll rate. ADTC (DLJC) recommended and the F-111 System Manager placed a flight restriction for carriage of 16 or more heavy stores between airspeeds of 400 and 460 KCAS and wing sweeps of 26 to 45 degrees. This restriction limited the bank angle to ±60 degrees and abrupt lateral control stick inputs were prohibited. The test was continued with aircraft configuration 29 in which store oscillations were again encountered (mission 76-08). The store oscillations were reported by the aircrew to decrease in intensity during lateral stick pulses at wing sweeps of 16, 26, and 35 degrees; they were absent at a wing sweep of 48 degrees, and recurred at a wing sweep of 35 degrees. The store oscillations encountered in aircraft configuration 29 were objectionable from an operational point of view.

CAPTIVE FLIGHTS - VIBRATIONAL ENVIRONMENT

Captive flights of the B-43, B-57, and B-61 vibrational fly around (VFA) test units were conducted under Test 324AWG03 to obtain data on the vibrational environment of the F-111. Similar flights were also conducted using the B-43 tail cans load unit (TCLU) to obtain data on structural loads. All data obtained were forwarded to Sandia Laboratories for reduction and analysis.

Typically these flights consisted of the following maneuvers:

1. Stabilize aircraft and then push over to 0.0 Gs immediately followed by a pullup to maximum allowance Gs.

2. Stabilize aircraft and then execute a level turn

3. Stabilize aircraft and then sweep wings

4. Stabilize aircraft and then extend and retract speed brakes.

When test item was in the weapons bay, all maneuvers were performed with the bay doors opened.

MUNITION SEPARATION TESTS

The objective of the separation tests was to verify that the munitions could be satisfactorily released from the F-111 within given flight envelopes. Safe separation was verified by review of the film exposed by the seven onboard cameras and by the photographer in the chase aircraft. The comments of the pilot of the primary/chase aircraft were also considered. The onboard cameras gave excellent coverage of the separation of the stores and subsequent fallaway. Possible bomb-to-bomb collisions during ripple releases could also be observed. Table 2 gives a complete list of the separation flights indicating the type of munition and the test configuration for each flight.

Each predicted envelope limit (i.e., airspeed and altitude) was incrementally approached during separation testing. Between sorties, the aircraft and chase photographic data were carefully analyzed prior to proceeding to the next drop. Ballistic data were simultaneously obtained as necessary.

Generally, all stores released with acceptable clearances from the F-111; however, the problems discussed in the following paragraphs were encountered.

CBU-38B/A. Safe dispensing and submunition separation occurred at all test points; however, the dunnage associated with the BLU-49 submunition of the CBU-38B/A impacted the aircraft when dispensing at 0.90 mach from stations 4 and 5. This dunnage consisted of a metal doubler ring, a plastic closure cap, and rubber O-rings (Figure 9). These items impacted the aft sides of the fuselage and the undersides of the horizontal stabilizers leaving marks. One rubber O-ring cracked the left speed bump camera window. One metal doubler smashed the left speed bump camera window (Figure 10) and other doublers left scratch marks on the underside of the left horizontal stabilizer. The plastic closure caps ejected well clear of the aircraft. All of this damage was very minor and did not represent a safety of flight hazard. However, film analysis showed possible doubler ring impact with the leading edge of the horizontal stabilizer at airspeeds above 0.87 mach. The doublers would probably only nick the leading edge, but this could represent an expensive long range maintenance problem. The metal doubler rings were observed to be passing within 6 inches of the surfaces of the horizontal stabilizer at 0.90 mach.

600-GALLON TANKS. During an initial check of the center of gravity (CG) of the fuel tanks used on this test, a majority were found to be aft of the manufacturer's aft CG limit of 28.5 inches. An informal survey was then conducted by General Dynamics of the 600-gallon tanks presently in the Air Force inventory. This survey showed the aft CG range of 26.5 to 31.0 inches aft of the forward lug. Instead of conducting an expensive ballasting program on the tanks, it was decided to test the tanks with a new CG range of 26.5 to 31.0 inches aft of the forward tank lug. Since the possibility of an aircraft/store collision is increased as the CG is moved aft, three tanks were dropped with the CG incrementally moved to the 31.0-inch aft limit. General Dynamics drawing 12FTB873 was used in moving the CG of the first tank forward to 26.5 inches aft of the forward lug. The second tank was tested with the CG 28.5 inches aft of the forward lug. The same drawing was used in installing external ballast on the rear of the remaining five tanks (Figure 11). The last five tanks were dropped with a CG at 31.0 inches aft of the forward lug. All separations were satisfactory.

BDU-8. On the release at 550 KCAS/1,000 feet MSL from the weapons bay with a forward QRC-335 pod, the BDU-8 exhibited a definite nose pitchup. In order to reduce the pitchup, the bomb rack orifice settings were

changed from -7 forward and -4 aft to -7 forward and -6 aft. The mission was repeated with satisfactory separation.

BALLISTIC TESTS

The F-111 Weapons Delivery Accuracy Test (324AWG04) was primarily conducted to obtain ballistic data for the MK 84 low drag general purpose (LDGP) bomb and the BDU-33B/B practice bomb when released at airspeeds from 0.8 mach to 1.3 mach. Complete time-space-position (TSPI) was obtained for all releases except for BDU-33B/B bombs above 5,000 feet. Only partial TSPI was obtained for the BDU-33B/B releases above 5,000 feet due to the small test item size.

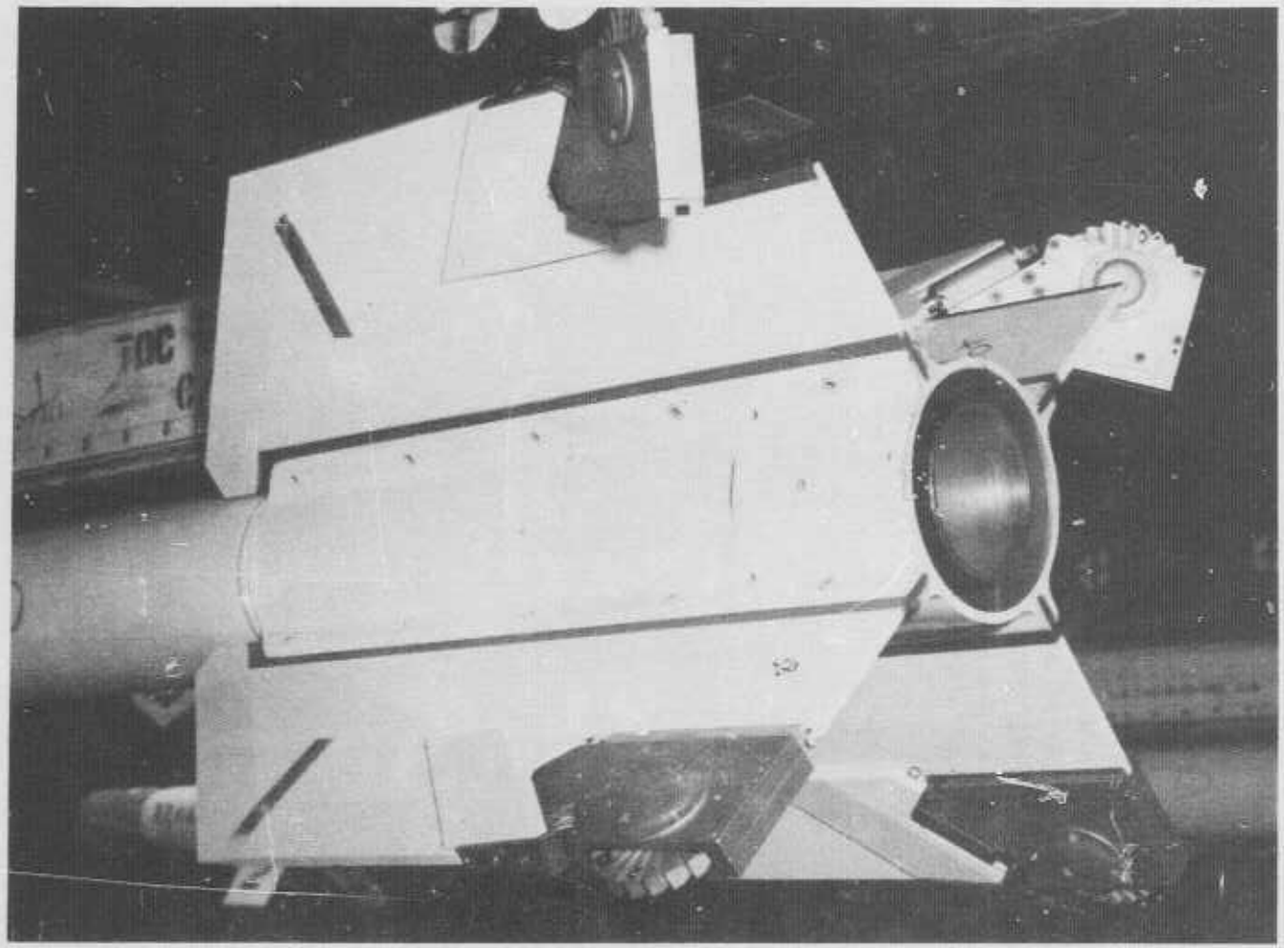

Figure 6. AIM-9J rollerons uncaged following third captive compatibility flight

Figure 7. Potting compound oozing out of AIM-9J guidance and control unit

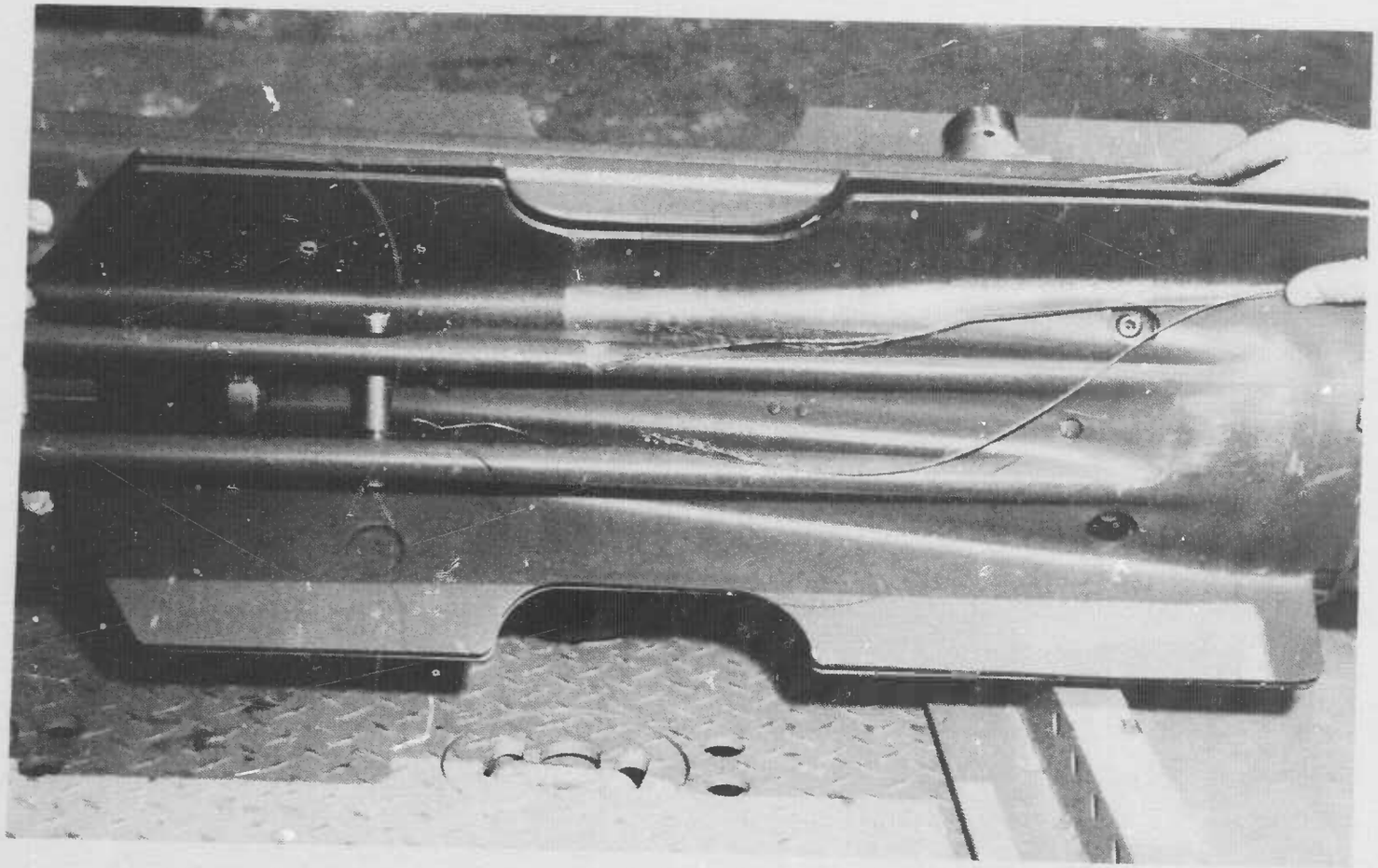

Figure 8. Modified MK 82 SE tail fin arming wire broken following a captive flight

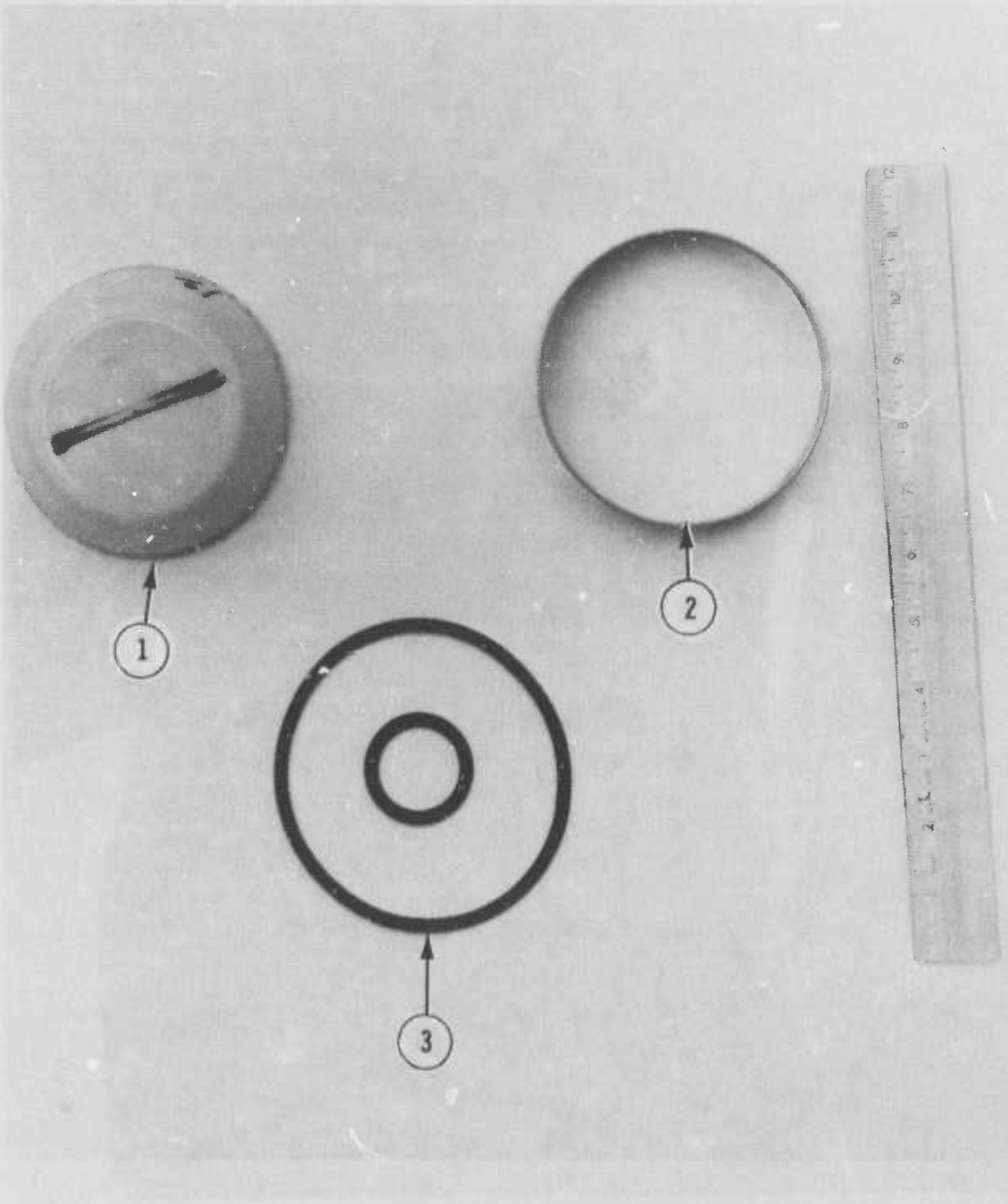

Figure 9. CBU-30A (CBU-38B/A) dunnage consisting of (1) plastic closure cap, (2) metal doubler ring, and (3) rubber O-rings

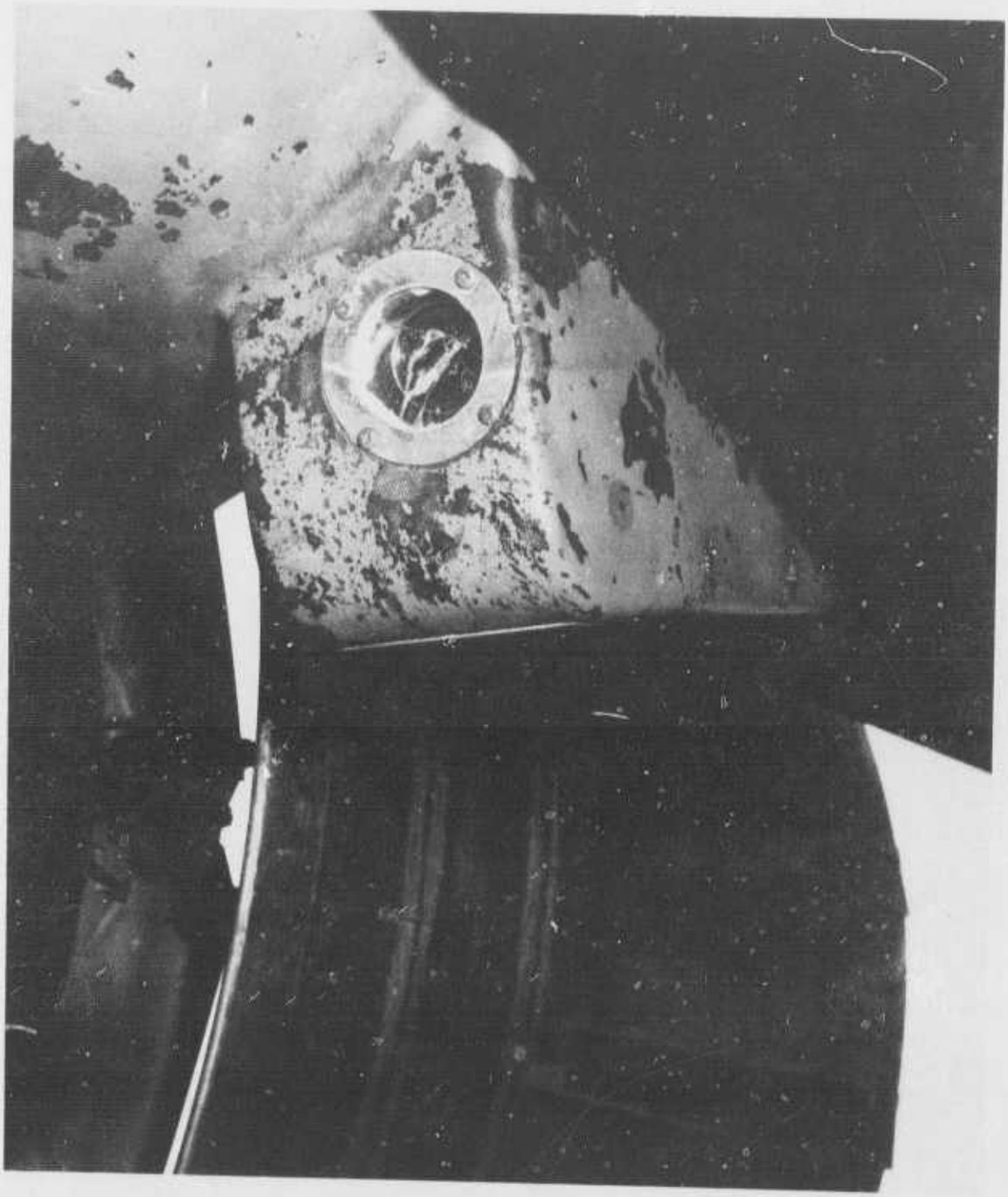

Figure 10. Left speed bump camera window smashed by metal doubler ring

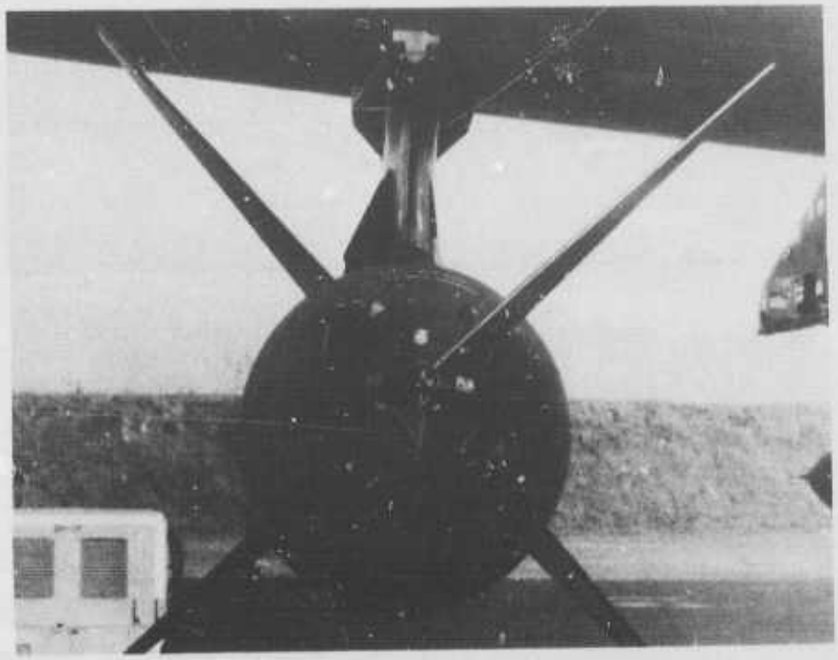

Figure 11. Metal ballast installed on the rear of a 600-gallon tank

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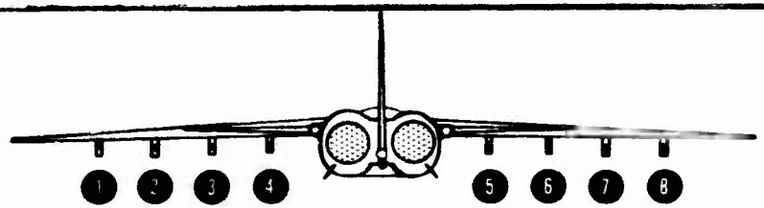
Table 1. Test loading configurations



Configuration number	1	2	3	4	Left bay	Right bay	5	6	7	8
1	Clean. No pylon	Clean. No pylon			Optional. Doors closed	Optional. Doors closed			Clean. No pylon	Clean. No pylon
2										
3										
4				Clean. No pylon			Clean. No pylon			
5				Empty pylon			Empty pylon			
6										
7				Empty pylon			Empty pylon			
8			Empty pylon					Empty pylon		
9			Empty pylon							
10										
11										
12				Empty pylon			Empty pylon			
13			Empty pylon					Empty pylon		
14				Clean. No pylon			Clean. No pylon			

13					pylon							Empty pylon				
14						Clean. No pylon					Clean. No pylon					
15					Empty pylon						Empty pylon	Empty pylon				
16																
17				Clean. No pylon									Clean. No pylon			
18																
19																
20						Empty pylon					Empty pylon					
21				Empty pylon		Empty pylon					Empty pylon		Empty pylon			
22				Empty pylon												
23				Clean. No pylon	Empty pylon				Empty			Empty pylon	Clean. No pylon			
24									Gun							
25																
26							Optional. Doors closed		Optional. Doors closed							
27									Gun							
28							Optional. Doors closed		Optional. Doors closed							
29						Empty pylon					Empty pylon					
30												Empty pylon				
31					Empty pylon with Aero-3							Empty pylon with Aero-3				
32						Clean. No pylon					Clean. No pylon					
33																

(The re

22			Empty pylon											
23			Clean. No pylon	Empty pylon				Empty			Empty pylon	Clean. No pylon		
24								Gun						
25														
26						Optional. Doors closed		Optional. Doors closed						
27								Gun						
28						Optional. Doors closed		Optional. Doors closed						
29					Empty pylon					Empty pylon				
30											Empty pylon			
31				Empty pylon with Aero-3							Empty pylon with Aero-3			
32					Clean. No pylon					Clean. No pylon				
33														
34				Empty pylon							Empty pylon			
35														
36				Empty pylon						Empty pylon				

Legend
● Weapon or dispenser ○ Missile ⊕ Fuel tank ▽ TER-9 ▽▽ BRU-3A/A All stations loaded Flat Slant

Note: Pylon includes MAU-12 rack, except Aero-3B for missile carriage.

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Table 2. Test mission summary

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
69-01	27 May 69	MK 82 SE	5		Captive compatibility					
69-02	28 May 69	MK 82 SE	1		Captive compatibility					
69-03	29 May 69	MK 82 SE	5	3, 6	Ripple pairs	20,000	0.6 M	0	45	50 ms; 10-degree angle of attack.
69-04	3 Jun 69	MK 82	2		Captive compatibility					
69-05	4 Jun 69	MK 82	2	3, 4, 5, 6	Train pairs	20,000	0.6 M	0	45	50 ms; 10-degree angle of attack.
69-06	17 Jun 69	M117R	6		Captive compatibility					
69-07/1	18 Jun 69	M117R	7	3	Ripple single	3,000	0.6 M	0	26	250 ms
69-07/2	18 Jun 69	M117R		6	Ripple single	3,000	0.8 M	0	26	250 ms
69-08/1	23 Jun 69	M117R	7	3	Ripple single	3,000	0.6 M	0	45	250 ms; entire BRU rack was jettisoned.
69-08/2	23 Jun 69	M117R		6	Ripple single	3,000	0.6 M	0	45	250 ms
69-09/1	26 Jun 69	M117R	7	3	Ripple single	2,000	0.6 M	0	45	250 ms
69-09/2	26 Jun 69	M117R		6	Ripple single	2,000	0.8 M	0	45	250 ms
69-10	30 Jun 69	M117	1		Captive compatibility					
69-11/1	1 Jul 69	M117	1	3	Ripple single	3,000	0.6 M	0	26	BRU station 5 hung.
69-11/2	1 Jul 69	M117		6	Ripple single	10,000	0.8 M	0	26	
69-11/3	1 Jul 69	M117		4	Ripple single	3,000	0.6 M	0	26	
69-11/4	1 Jul 69	M117		5	Ripple single	10,000	0.8 M	0	26	
69-12/1	22 Jul 69	M117	1	3	Ripple single	3,000	0.65 M	0	54	
69-12/2	22 Jul 69	M117		6	Ripple single	3,000	0.8 M	0	54	
69-12/3	22 Jul 69	M117		4	Ripple single	3,000	0.65 M	0	54	
69-12/4	22 Jul 69	M117		5	Ripple single	3,000	0.8 M	0	54	
69-13/1	23 Jul 69	M117	1	3	Ripple single	20,000	0.6 M	0	50	

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
69-13/2	23 Jul 69	M117		6	Ripple single	20,000	0.6 M	0	50	
69-13/3	23 Jul 69	M117		4	Ripple single	20,000	0.6 M	0	50	
69-13/4	23 Jul 69	M117		5	Ripple single	20,000	0.6 M	0	50	BRU stations 5 and 6 hung.
69-14/1	26 Jul 69	M117	2	3, 6	Ripple pairs	3,000	0.6 M	0	40	50 ms
69-14/2	26 Jul 69	M117		4, 5	Ripple pairs	3,000	0.6 M	0	40	50 ms
69-15	1 Aug 69	CBU-24B/B	7		Captive compatibility					Carriage to 0.8 mach. Flat four.
69-16/1	4 Aug 69	CBU-24B/B	7	3	Ripple single	3,000	0.6 M	0	26	
69-16/2	4 Aug 69	CBU-24B/B		6	Ripple single	3,000	0.8 M	0	26	Station 4 pylon 6 hung (rack malfunction).
69-17	13 Sep 69	6 MK 106 and rocket BDU-33 and rocket	12		Captive compatibility					SUU-20A/A
69-18/1	12 Sep 69	6 MK 106	12	3	Ripple single	4,000	0.8 M	20	45	
69-18/2	12 Sep 69	4 MK 106, 2 BDU-33 A/B		6	Ripple single	4,000	0.9 M	20	45	
69-18/3	12 Sep 69	3 2.75-in. rockets		3	Ripple single	4,000	0.8 M	0	45	All rockets hung.
69-18/4	12 Sep 69	4 2.75-in. rockets		6	Ripple single	6,000	0.9 M	45	45	Two rockets hung.
69-19/1	13 Sep 69	6 MK 106	13	4	Ripple single	4,000	0.8 M	20	45	
69-19/2	13 Sep 69	6 MK 106		5	Ripple single	4,000	0.9 M	20	45	
69-19/3	13 Sep 69	4 2.75-in. rockets		4	Ripple single	4,000	0.8 M	0	45	
69-19/4	13 Sep 69	2.75-in. rocket		5	Ripple single	8,000/ 6,000	0.9 M/ 0.9 M	45	1	No rockets fired.
69-20/1	15 Sep 69	6 MK 106	15	4	Ripple single	5,000	0.8 M	45	45	One fell inadvertently, test run at +3.5 G.
69-20/2	15 Sep 69	4 2.75-in. rockets		4	Ripple single	6,000	0.9 M	45	45	

69-21/1	16 Sep 69	6 BDU-33	12	3L	Ripple single	7,000	0.85 M	30	45	
69-21/2	16 Sep 69	6 BDU-33		6R	Ripple single	7,500	0.95 M	30	45	
69-21/3	16 Sep 69	4 2.75-in. rockets		6	Ripple single	6,000	0.9 M	45	45	
69-22/1	17 Sep 69	6 BDU-33	12	3	Ripple single	7,500	0.95 M	45	45	Three BDUs hung.
69-22/2	17 Sep 69	6 BDU-33		6	Ripple single	5,000	0.8 M	45	45	45-degree climb
69-23/1	18 Sep 69	6 BDU-33	13	4	Ripple single	7,000	0.85 M	30	45	
69-23/2	18 Sep 69	6 BDU-33		5	Ripple single	7,500	0.95 M	30	45	
69-24/1	19 Sep 69	6 BDU-33	13	4	Ripple single	7,500	0.95 M	45	45	
69-24/2	19 Sep 69	6 BDU-33		5	Ripple single	5,000	0.8 M	45 3 Gs	45	
69-25/1	22 Sep 69	M117	1	3,6	Ripple pairs	3,000	0.8 M	0	54	
69-25/2	22 Sep 69	M117		4,5	Ripple pairs	3,000	0.8 M	0	54	
69-26/1	8 Oct 69	M117	5	3	Ripple single	3,000	0.8 M	0	54	50 ms
69-26/2	8 Oct 69	M117		6	Ripple single	3,000	0.8 M	0	72	50 ms
69-27	15 Dec 69	CBU-24B/B	5		Captive compatibility					
69-28/1	17 Dec 69	CBU-24B/B	5	3	Ripple single	3,000	0.6 M	0	26	
69-28/2	17 Dec 69	CBU-24B/B		6	Ripple single	3,000	0.8 M	0	26	New fin
69-29	18 Dec 69	MK 34	11		Captive compatibility					Three-inch clearance between bombs on stations 4 and 5 and fuselage at wing sweep = 72 degrees. Airframe buffet at 0.8 mach 26-degree wing sweep and 2.5 Gs (increased with increasing Gs.
69-30/1	22 Dec 69	MK 84	12	6	Single	20,000	1.3 M	0	72	
69-30/2	22 Dec 69	MK 84		3	Single	20,000	1.3 M	0	72	
70-01/1	1 Jul 70	CBU-24B/B	5	3	Ripple single	2,000	0.7 M	0	45	Fahnstock slips scratched slab, 50 ms.
70-02/2	1 Jul 70	CBU-24B/B		6	Ripple single	2,000	0.8 M	0	45	
70-02/1	1 Sep 70	BLU-58	25	LWB	Single	2,070	0.82 M	0	---	Test 670AY093
70-02/2	1 Sep 70	BLU-58		RWB	Single	1,970	0.85 M	0	---	
70-03/1	9 Sep 70	BLU-58	25	LWB	Single	6,355	0.91 M	0	---	Test 670AY098

CONTINUED

Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
70-03/2	9 Sep 70	BLU-58	25	RWB	Single	6,685	0.96 M	0	---	
70-04/1	22 Sep 70	BLU-58	25	LWB	Single	20,250	1.18 M	0	---	Test 670AY098
70-04/2	22 Sep 70	BLU-58		RWB	Single	19,855	1.28 M	0	---	
70-05/1	30 Oct 70	CBU-24B/B	5	3	Ripple single	20,000	0.8 M	0	54	10-degree angle of attack, 50 ms.
70-05/2	30 Oct 70	CBU-24B/B		6	Ripple single	10,000	0.8 M	0	45	50 ms
70-06/1	2 Nov 70	600-gal tank (empty)	32	3, 6	Emergency jettison	22,000	0.70 M 300 KCAS	0	26	Test 324AY019
70-07/1	5 Nov 70	600-gal tank (empty)	32	3, 6	Emergency jettison	22,00	0.70 M 300 KCAS	0	26	Test 324AY019
70-8	6 Nov 70	CBU-24B/B	5	Captive compatibility						
70-09/1	13 Nov 70	CBU-24B/B	5	3	Ripple single	2,000	0.8 M	0	54	50 ms
70-09/2	13 Nov 70	CBU-24B/B		6	Ripple single	2,000	0.85 M	0	54	Pass 3 release mode was release single due to a hung bomb on BRU station 3, aircraft station 6.
70-09/3	13 Nov 70	CBU-24B/B		6	Ripple single	2,000	0.85 M	0	54	
70-10	20 Nov 70	600-gal tank (empty)	33	Captive compatibility						Test 324AY019
70-11/1	24 Nov 70	600-gal tank (empty)	33	6	Jettison select	12,000	0.75 M 420 KCAS	0	26	Test 324AY019
70-12/1	3 Dec 70	600-gal tank (empty)	34	5	Jettison select	12,000	0.75 M 420 KCAS	0	26	Test 324AY019
70-13/1	7 Dec 70	600-gal tank (empty)	33	6	Jettison select	6,000	0.75 M	0	26	Test 324AY019
70-14/1	23 Dec 70	CBU-24B/B	5	3	Ripple single	2,000	0.9 M	0	54	The bombs released from station 3 had a noticable tendency to roll, 50 ms.
70-14/2	23 Dec 70	CBU-24B/B		6	Ripple single	2,000	0.3 M	45 climb	45	
70-15/1	28 Dec 70	600-gal tank (empty)	34	5	Jettison select	6,000	0.75 M 455 KCAS	0	26	Test 324AY019

71-01/1	6 Jan 71	600-gal tank (empty)	32	6	Jettison select	6,000	0.75 M 455 KCAS	0	26	Test 324AY019
71-02/1	14 Jan 71	600-gal tank (empty)	35	6	Jettison select	2,000	0.73 M 475 KCAS	0	26	BDU-8 on stations 4 and 5. Test 324AY019.
71-03/1	20 Jan 71	BLU-58	25	LWB/ RWB	Salvo	20,410	1.25 M	0	---	Test 670AY098
71-04/1	20 Jan 71	600-gal tank (empty)	34	5	Jettison select	2,000	0.75 M 480 KCAS	0	26	Test 324AY019
71-05/1	21 Jan 71	CBU-24B/B	4	3	Ripple single	5,000	0.9 M	30	45	
71-05/2	21 Jan 71	CBU-24B/B		6	Ripple single	9,000	0.9 M	45	45	
71-06/1	16 Feb 71	M117	25	LWB	Single	2,000	0.80 M	0	35	Test 5064W001
71-06/2	16 Feb 71	M117		RWB	Single	2,000	0.85 M	0	35	
71-07	16 Feb 71	CBU-24B/B	4	3, 6	Ripple pairs		0.9 M	45	45	50 ms
71-08/1	17 Feb 71	MK 84	12	3	Single	20,000	1.3 M	0	72	
71-08/2	17 Feb 71	MK 84		6	Single	20,000	1.3 M	0	72	
71-09/1	18 Feb 71	M117M	25	LWB	Single	6,000	0.90 M	0	---	Test 5064W001
71-09/2	18 Feb 71	M117M		RWB	Single	6,000	0.95 M	0	---	Side of MAU-12 blew out.
71-10/1	8 Mar 71	M117M	25	LWB	Single	6,000	0.90 M	0	---	Test 5064W001
71-10/2	8 Mar 71	M117M		RWB	Single	20,000	1.20 M	0	---	
71-11	9 Jun 71	BDU-33A/A	11		Captive compatibility					No flap restrictions: SUU-21/A on stations 3, 4, 5, SUU-20B/A on station 6.
71-12/1	10 Jun 71	BDU-33A/B	12	3	Single	2,000	0.8 M	0	26	SUU-21/A
71-12/2	10 Jun 71	BDU-33A/B		3	Single	2,000	0.8 M	0	45	
71-12/3	10 Jun 71	BDU-33A/B		3	Single	2,000	0.8 M	0	60	
71-12/4	10 Jun 71	MK 106		6	Single	2,000	0.8 M	0	26	
71-12/5	10 Jun 71	MK 106		6	Single	2,000	0.8 M	0	45	
71-12/6	10 Jun 71	MK 106		6	Single	2,000	0.8 M	0	60	
71-13/1	14 Jun 71	MK 84	11	3, 6	Pairs	5,000	0.8 M	45 climb	45	Plus 3 Gs
71-13/2	14 Jun 71	MK 84		4, 5	Pairs	5,000	0.8 M	45 climb	45	Plus 4 Gs
71-14/1	17 Jun 71	BDU-33A/B	11	3	Single	2,000	0.8 M	0	26	On board film revealed bot. 's fins were striking dispenser doors. The doors were adjusted and additional clearance was obtained.
71-14/2	17 Jun 71	MK 106		6	Single	2,000	0.8 M	0	26	
71-14/3	17 Jun 71	BDU-33A/B		4	Single	2,000	0.8 M	0	26	
71-14/4	17 Jun 71	MK 106		5	Single	2,000	0.8 M	0	26	SUU-21/A
71-14/5	17 Jun 71	BDU-33A/B		3	Single	2,000	0.8 M	0	45	
71-14/6	17 Jun 71	MK 106		6	Single	2,000	0.8 M	0	45	
71-14/7	17 Jun 71	BDU-33A/B		4	Single	2,000	0.8 M	0	45	

CONTINUED

Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
71-14/8	17 Jun 71	MK 106		5	Single	2,000	0.8 M	0	45	
71-15/1	18 Jun 71	600-gal tank (empty)	34	5	Jettison select	6,000	0.75 M 455 KCAS	0	26	Test 324AY019
71-15/2	18 Jun 71	600-gal tank (empty)		4	Jettison select	20,000	225 KCAS	0	26	Test 324AY019
71-16/1	22 Jun 71	BDU-33A/A	11	3	Single	4,000	0.85 M	0	45	SUU-21/A
71-16/2	22 Jun 71	MK 106		6	Single	4,000	0.85 M	0	45	
71-16/3	22 Jun 71	BDU-33A/A		4	Single	4,000	0.85 M	0	45	
71-16/4	22 Jun 71	MK 106		5	Single	4,000	0.85 M	0	45	
71-16/5	22 Jun 71	BDU-33A/A		3	Single	4,000	9.0 M	0	45	
71-16/6	22 Jun 71	MK 106		6	Single	4,000	9.0 M	0	45	
71-16/7	22 Jun 71	BDU-33A/A		4	Single	4,000	9.0 M	0	45	
71-16/8	22 Jun 71	MK 106		5	Single	4,000	9.0 M	0	45	
71-17/1	23 Jun 71	600-gal tank (empty)	36	6	Jettison select	6,000	0.75 M 455 KCAS	0	26	Test 324AY019
71-17/2	23 Jun 71	600-gal tank (empty)	36	4	Jettison select	2,000	0.75 M 480 KCAS	0	26	Test 324AY019
71-18/1	25 Jun 71	BDU-33A/B	11	3	Single	2,000	0.90 M	0	60	SUU-21/A
71-18/2	25 Jun 71	BDU-33A/B		4	Single	2,000	0.90 M	0	60	
71-18/3	25 Jun 71	MK 106		6	Single	8,000	0.90 M	0	60	
71-18/4	25 Jun 71	MK 106		5	Single	8,000	0.90 M	0	60	
71-18/5	25 Jun 71	BDU-33A/B		3	Single	2,000	0.95 M	0	60	
71-18/6	25 Jun 71	BDU-33A/A		4	Single	2,000	0.95 M	0	60	
71-18/7	25 Jun 71	MK 106		6	Single	8,000	0.95 M	0	60	
71-18/8	25 Jun 71	MK 106		5	Single	8,000	0.95 M	0	60	
71-19	28 Jun 71	MK 84	12	3,6	Pairs	5,000	0.8 M	45 climb	45	
71-20/1	30 Jun 71	MK 106	11	6	Single	4,000	560 KCAS	0	45	Separation was clean on all releases. The BDU released on run 9 released abnormally; it pitched down, then stabilized.
71-20/2	30 Jun 71	MK 106		6	Single	4,000	560 KCAS	0	60	
71-20/3	30 Jun 71	MK 106		5	Single	3,000	560 KCAS	0	45	
71-20/4	30 Jun 71	MK 106		5	Single	3,000	560 KCAS	0	60	
71-20/5	30 Jun 71	BDU-33A/B		3	Single	3,000	0.95 M	0	45	

71-20/6	30 Jun 71	BDU-33A/B		3	Single	3,000	0.95 M	0	60	
71-20/7	30 Jun 71	BDU-33A/B		4	Single	3,000	0.95 M	0	45	
71-20/8	30 Jun 71	BDU-33A/B		4	Single	3,000	0.95 M	0	60	
71-20/9	30 Jun 71	BDU-33A/B		3	Single	3,000	0.95 M	0	45	
71-20/10	30 Jun 71	MK 106		6	Single	3,000	560 KCAS	0	60	
71-21/1	1 Jul 71	MK 106	11	6	Single	8,000	0.95 M	20	60	SUU-21/A
71-21/2	1 Jul 71	MK 106		5	Single	8,000	0.95 M	20	60	
71-21/3	1 Jul 71	BDU-33A/B		3	Single	8,000	0.95 M	30	60	
71-21/4	1 Jul 71	BDU-33A/B		4	Single	8,000	0.95 M	30	60	
71-21/5	1 Jul 71	BDU-33A/B		3	Single	8,000	0.95 M	45	50	
71-21/6	1 Jul 71	BDU-33A/B		4	Single	8,000	0.95 M	45	50	
71-22/1	2 Jul 71	BDU-33A/B	11	3	Single	8,000	0.95 M	45	50	Releases made during +4 G pull.
71-22/2	2 Jul 71	BDU-33A/B		4	Single	8,000	0.95 M	45	50	Releases made during +4 G pull.
71-22/3	2 Jul 71	MK 106		6	Single	8,000	0.95 M	45	50	Releases made during +4 G pull.
71-22/4	2 Jul 71	MK 106		5	Single	8,000	0.95 M	45	50	Releases made during +4 G pull.
71-23/1	8 Jul 71	BDU-33A/B	13	4	Single	2,000	0.95 M	0	60	
71-23/2	8 Jul 71	BDU-33A/B		4	Single	2,000	0.90 M	0	60	
71-23/3	8 Jul 71	BDU-33A/B		4	Single	2,000	0.95 M	0	60	
71-23/4	8 Jul 71	MK 106		5	Single	2,000	0.85 M	0	60	
71-23/5	8 Jul 71	MK 106		5	Single	2,000	0.85 M	0	60	
71-23/6	8 Jul 71	MK 106		5	Single	2,000	0.85 M	0	60	
71-24	9 Jul 71	MK 84	13	4,5	Pairs	20,000	0.6 M	0	42	Ten-degree angle of attack at release satisfactory. Dive deliveries cancelled due to weather. SUU-21/A.
71-25/1	13 Jul 71	BDU-33A/B	13	4	Single	2,000	0.95 M	0	60	
71-75/2	13 Jul 71	BDU-33A/B		4	Single	2,000	0.95 M	0	60	
71-25/3	13 Jul 71	BDU-33A/B		4	Single	2,000	0.95 M	0	60	
71-26/1	15 Jul 71	MK 82	3	3,6	Pairs	1,000	0.85 M	0	45	50 ms
71-26/2	15 Jul 71	MK 82		4	Ripple single	1,000	0.85 M	0	45	50 ms
71-26/3	15 Jul 71	MK 82		5	Single	5,000	0.85 M	0	45	
71-26/4	15 Jul 71	MK 82		5	Single	5,000	0.85 M	0	45	
71-26/5	15 Jul 71	MK 82		5	Ripple single	5,000	0.85 M	0	45	50 ms
71-27	16 Jul 71	CBU-24B/B	1		Captive compatibility					
71-28/1	20 Jul 71	MK 106	13	5	Single	8,000	560 KCAS	20	60	SUU-21/A
71-28/2	20 Jul 71	MK 106		5	Single	8,000	560 KCAS	20	60	
71-28/3	20 Jul 71	BDU-33A/B		4	Single	8,000	0.95 M	42	50	
71-28/4	20 Jul 71	BDU-33A/B		4	Single	8,000	0.95 M	45	50	
71-29/1	22 Jul 71	BDU-33A/B	14	3	Single	2,000	0.95 M	0	60	SUU-21/A
71-29/2	22 Jul 71	BDU-33A/B		3	Single	8,000	560 KCAS	0	60	
71-29/3	22 Jul 71	MK 106		6	Single	8,000	560 KCAS	20	60	
71-29/4	22 Jul 71	MK 106		6	Single	8,000	0.95 M	45	50	

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
71-30	7 Oct 71	CBU-24B/B	1	3	Ripple single	2,000	0.8 M	0	45	Weapon computer malfunction prevented bomb releases after pass 1 (results were adequate to certify separation from an outboard pivot pylon.
71-31	17 Nov 71	MK 84	12	3, 6	Emergency jettison	6,000	0.95 M	45	50	Weapon system malfunction precluded a normal pairs release.
71-32/1	8 Dec 71	MK 84	11	3, 6	Pairs	6,000	0.95 M	0	50	
71-32/2	8 Dec 71	MK 84		4, 5	Pairs	6,000	0.95 M	0	50	
71-01/1	7 Feb 72	MK 84	11	3, 6	Pairs	20,000	1.24 M	0	60	
72-01/2	7 Feb 72	MK 84		4	Single	20,000	1.26 M	0	60	
72-01/3	7 Feb 72	MK 84		5	Single	20,000	1.28 M	0	60	The MK 84 on station 5 missed the aircraft inlet by 1 inch after release.
72-02/1	8 Feb 72	CBU-24H/B	8	5	Ripple single	2,000	0.8 M	0	45	50 ms
72-02/2	8 Feb 72	CBU-24H/B		4	Single	10,000	0.8 M	0	45	
72-02/3	8 Feb 72	CBU-24H/B		4	Single	10,000	0.8 M	0	45	
72-02/4	8 Feb 72	CBU-24H/B		4	Single	10,000	0.8 M	0	45	
72-02/5	8 Feb 72	CBU-24H/B		4	Single	10,000	0.8 M	0	45	
72-03	9 Feb 72	BDU-33A/B MK 106	11	Captive compatibility						SUU-20B/A
72-04/1	17 Feb 72	MK 82	3	3, 6	Ripple pairs	5,000	0.86 M	30	45	Paint scratch on lower side of left stabilizer probably caused by an arming wire clip.
72-4/2	17 Feb 72	MK 82	3	4, 5	Ripple pairs	4,700	0.83 M	28	45	
72-5/1	23 Feb 72	BDU-33A/B	12	3	Ripple single	2,000		0	45	Considerable buffet was noticed with the speed brake extended. Also, the tailhook cover was lost on this flight. SUU-20B/A.
72-5/2	23 Feb 72	MK 106	12	6	Ripple single	2,000		0	45	
72-6/1	24 Feb 72	M117	2	Captive compatibility						
72-6/2	24 Feb 72	M117		3, 6	Ripple pairs	7,450	0.8 M	0	40	
72-07	25 Feb 72	M117	9	4, 5	Ripple pairs	7,500	0.8 M	0	40	The bombs on the forward inboard shoulder of each BRU-3A/B almost hit the aircraft. The M117s on the rear inboard shoulder crossed beneath the aircraft and collided with each other.
72-08/1	29 Feb 72	BDU-33A/B	11	3	Single	2,000	450 KCAS	0	45	Several engine air ejector door linkage springs were broken due to effects of the open speed brake.

72-08/2	29 Feb 72	BDU-33A/B		4	Single	2,000	450 KCAS	0	45	
72-08/3	29 Feb 72	MK 106		5	Single	2,000	450 KCAS	0	45	
72-08/4	29 Feb 72	MK 106		6	Single	2,000	450 KCAS	0	45	
72-08/5	29 Feb 72	MK 106		5	Ripple	2,000	450 KCAS	0	60	
72-08/6	29 Feb 72	MK 106		6	Ripple	2,000	450 KCAS	0	60	
72-08/7	29 Feb 72	BDU-33A/B		3	Ripple	2,000	450 KCAS	0	60	
72-08/8	29 Feb 72	BDU-33A/B		4	Ripple	2,000	450 KCAS	0	60	
72-09/1	31 Mar 72	MK 84	13	4	Single	20,000	1.26 M	0	60	
72-09/2	31 Mar 72	MK 84		5	Single	20,000	1.32 M	0	60	The MK 84 on station 5 almost hit the aircraft after release.
72-10/1	10 Apr 72	MK 106	11	3	Ripple single	2,000	525 KCAS	0	60	One engine air ejector door linkage spring failed on left engine. SUU-20B/A.
72-10/2	10 Apr 72	BDU-33A/B		6	Ripple single	2,000	525 KCAS	0	60	
72-10/3	10 Apr 72	BDU-33A/B		5	Ripple single	2,000	525 KCAS	0	60	
72-10/4	10 Apr 72	MK 106		4	Ripple single	2,000	525 KCAS	0	38	
72-11/1	13 Apr 72	BDU-33A/B MK 106	11	3, 6	Ripple pairs	2,000	590 KCAS	0	60	SUU-B/A
72-11/2	13 Apr 72	BDU-33A/B MK 106		4, 5	Ripple pairs	2,000	590 KCAS	0	60	
72-12	14 Apr 72	MK 84	13	4, 5	Pairs	19,000	1.28 M	0	60	
72-13/1	2 May 72	M117	3	3, 6	Ripple pairs	6,000	0.83 M	29	45	After landing left engine fan was severely damaged probably due to ingestion of bomb rack safety pin.
72-13/2	2 May 72	M117		4, 5	Ripple pairs	6,200	0.8 M	29	45	50 ms
72-14/1	23 May 72	BDU-33A/B	11	3, 6	Ripple pairs	24,000	1.27 M	0	60	SUU-20B/A
72-14/2	23 May 72	BDU-33A/B		4, 5	Ripple pairs	22,700	1.30 M	0	60	
72-15/1	24 May 72	MK 106	11	3	Ripple single	7,000	0.90 M	20	45	The lower outboard ejector door linkage spring on each engine failed during flight. SUU-20B/A.
72-15/2	24 May 72	MK 106		4	Ripple single	5,000	0.88 M	20	45	

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
72-15/3	24 May 72	BDU-33A/B		5, 6	Ripple pairs	5,000	0.88 M	30	45	
72-16	31 May 72	BDU-33A/B	11	3, 4, 5, 6	Ripple salvo	11,500	0.95 M	58	45	Speed brake was not used during this flight. SUU-20B/A.
72-17	1 Jun 72	M117	9	4, 5	Ripple pairs	20,000	0.6 M	0	40	Ten-degree angle of attack at release. 80 ms.
72-18/1	16 Jun 72	CBU-24B/B	1	3, 6	Ripple pairs	7,000	0.8 M	30	35	The underside of the right stabilizer was scratched. 50 ms.
72-18/2	16 Jun 72	CBU-24B/B		4, 5	Ripple pairs	5,700	460 KCAS	30	45	
72-19	22 Jun 72	CBU-24B/B	1	3, 4, 5, 6	Ripple salvo	5,500 to 6,000	0.8 M		45	Released in approximately 45-degree nose-up attitude with +4 Gs and maximum afterburner.
72-20	5 Jun 72	CBU-24B/B	1	3, 4, 5, 6	Ripple salvo	8,000	0.8 M	44	45	Bomb 2 on station 5 and bomb 6 on station 6 were hung due to a BRU rack malfunction.
72-21	7 Jul 72	CBU-24B/B	1	3, 4, 5, 6	Ripple salvo	20,000	0.6 M	0	36	Ten-degree angle of attack at release. Bomb 4 on station 4 and bombs 1 and 2 on station 5 were hung, but released normally when wing sweep was changed to 42 degrees.
72-22	9 Nov 72	BLU-1C/B	16	Captive compatibility						Twelve-finned BLU-1C/B bombs. Unacceptable store damage and undesirable aircraft control characteristics. Finned BLU testing terminated.
72-23/1	15 Nov 72	M117	1	3, 6	Ripple pairs	4,800	0.8 M		45	Released at approximate 30 degrees nose up and 4.0 G.
72-23/2	15 Nov 72	M117		4, 5	Ripple pairs	4,800	0.8 M		45	Released over 30 degrees nose up and 4.0 G.
72-24/25	20 Nov 72	MK 84 LGB	11	Captive compatibility						Stable, slight buffet with extended wing at 580 KCAS.
72-26/1	21 Nov 72	MK 84 LGB	11	3	Single	5,000	0.8 M	0	26	
72-26/2	21 Nov 72	MK 84 LGB		6	Single	5,000	0.8 M	0	26	
72-26/3	21 Nov 72	MK 84 LGB		4	Single	5,000	0.8 M	0	26	
72-26/4	21 Nov 72	MK 84 LGB		5	Single	5,000	0.8 M	0	26	
72-27/1	24 Nov 72	MK 84 LGB	11	3	Single	5,000	0.85 M	0	45	
72-27/2	24 Nov 72	MK 84 LGB		6	Single	5,000	0.90 M	0	45	
72-27/3	24 Nov 72	MK 84 LGB		4	Single	5,000	0.85 M	0	45	
72-27/4	24 Nov 72	MK 84 LGB		5	Single	5,000	0.90 M	0	45	

72-28/1	30 Nov 72	MK 84 LGB	11	3	Single	4,800	0.95 M	0	54	
72-28/2	30 Nov 72	MK 84 LGB		6	Single	4,800	0.95 M	0	54	
72-28/3	30 Nov 72	MK 84 LGB		5	Single	5,000	0.95 M	0	54	
72-28/4	30 Nov 72	MK 84 LGB		4	Single	5,000	0.95 M	0	54	
72-29/1	7 Dec 72	MK 84 LGB	11	3	Single	11,000	0.96 M	31	45	
72-29/2	7 Dec 72	MK 84 LGB		6	Single	12,500	0.96 M	45	45	Damage to pylon.
72-29/3	7 Dec 72	MK 84 LGB		4	Single	12,000	0.96 M	30	45	
72-29/4	7 Dec 72	MK 84 LGB		5	Single	11,700	0.95 M	46	45	
72-30/1	11 Dec 72	MK 84 LGB	11	3, 6	Pairs	5,000	0.90 M	30 climb	45	Plus 4 G release.
72-30/2	11 Dec 72	MK 84 LGB		4, 5	Pairs	5,000	0.92 M	30 climb	45	Plus 4 G release.
72-31	13 Dec 72	MK 84 LGB	14	3, 6	Pairs	5,000	0.91	30 climb	60	Plus 4 G release.
72-32/1	14 Dec 72	MK 84 LGB	14	3	Single	5,000	0.85 M	0	45	
72-32/2	14 Dec 72	MK 84 LGB		6	Single	5,000	0.95 M	0	60	
73-01/02	9 Jan 73	BLU-1C/B	17		Captive compatibility					Eight unfinned BLU-1C/B bombs buffet above 340 KCAS.
73-03/1	11 Jan 73	BLU-1C/B (U)	17	3, 6	Pairs	1,000	0.60 M	0	26	Eight unfinned BLU-1C/B bombs. One hung BLU on station 4, left shoulder of the TER.
73-03/2	11 Jan 73	BLU-1C/B (U)		3, 6	Pairs	1,000	0.60 M	0	26	
73-03/3	11 Jan 73	BLU-1C/B (U)		4, 5	Pairs	1,000	0.60 M	0	26	
73-03/4	11 Jan 73	BLU-1C/B (U)		4	Single	1,000	0.60 M	0	26	
73-03/5	11 Jan 73	BLU-1C/B (U)		5	Single	1,000	0.60 M	0	26	
73-04/1	12 Jan 73	BLU-1C/B	17	3, 6	Pairs	1,500	0.65 M	0	26	Unfinned.
73-04/2	12 Jan 73	BLU-1C/B		3, 6	Pairs	1,500	0.65 M	0	26	
73-04/3	12 Jan 73	BLU-1C/B		4, 5	Pairs	1,500	0.65 M	0	26	
73-04/4	12 Jan 73	BLU-1C/B		4, 5	Pairs	1,500	0.65 M	0	26	
73-05/1	15 Jan 73	BLU-1C/B	17	3, 6	Pairs	1,900	0.70 M	0	26	Eight unfinned BLU-1C/B bombs.
73-05/2	15 Jan 73	BLU-1C/B		3, 6	Pairs	1,900	0.70 M	0	26	
73-05/3	15 Jan 73	BLU-1C/B		4, 5	Pairs	2,100	0.70 M	0	26	
73-05/4	15 Jan 73	BLU-1C/B		4, 5	Pairs	2,100	0.70 M	0	26	
73-06/1	16 Jan 73	BLU-1C/B	17	3, 6	Pairs	2,000	0.73 M	0	26	Eight unfinned BLU-1C/B bombs; light buffet at 0.73 mach. Store clearance of 2 to 3 inches from bottom of wing.
73-06/2	16 Jan 73	BLU-1C/B		3, 6	Pairs	2,000	0.73 M	0	26	
73-06/3	16 Jan 73	BLU-1C/B		4, 5	Pairs	2,000	0.73 M	0	26	
73-06/4	16 Jan 73	BLU-1C/B		4, 5	Pairs	2,000	0.73 M	0	26	
73-07/1	18 Jan 73	BLU-1C/B	17	3, 6	Pairs	2,000	0.75 M	0	26	Eight unfinned BLU-1C/B bombs. Moderate buffet at 0.75 mach. Store clearance of 1 to 2 inches from bottom of wing.
73-07/2	18 Jan 73	BLU-1C/B		3, 6	Pairs	2,000	0.75 M	0	26	
73-07/3	18 Jan 73	BLU-1C/B		4, 5	Pairs	2,000	0.75	0	26	

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
73-07/4	18 Jan 73	BLU-1C/B		4,5	Pairs	2,000	0.75 M	0	26	
73-08	30 Jan 73	MK 84	13	4,5	Pairs	19,500	1.16 M	0	60	
73-09/1	19 Jan 73	BLU-1C/B	17	3,6	Ripple pairs	1,000	0.6 M	0	26	Eight unfinned BLU-1C/B bombs. 250 ms.
73-09/2	19 Jan 73	BLU-1C/B		4,5	Ripple pairs	1,000	0.6 M	0	26	
73-10/1	31 Jan 73	BLU-1C/B	17	3,6	Ripple pairs	1,500	0.65 M	0	26	Eight unfinned BLU-1C/B bombs. 250 ms.
73-10/2	31 Jan 73	BLU-1C/B		4,5	Ripple pairs	1,500	0.65 M	0	26	
73-11/1	7 Feb 73	BLU-1C/B	17	3,6	Ripple pairs	2,000	0.70 M	0	26	Eight unfinned BLU-1C/B bombs. One hung BLU on station 3 left shoulder of the TER store clearance of 5 to 6 inches from aft end of the pylon.
73-11/2	7 Feb 73	BLU-1C/B		4,5	Ripple pairs	2,000	0.70 M	0	26	
73-12/1	13 Feb 73	BLU-1C/B	17	4,5	Ripple pairs	2,500	0.73 M	0	26	Eight unfinned BLU-1C/B bombs. Store clearance of 1 to 2 inches from aft end of the pylon. 250 ms.
73-12/2	13 Feb 73	BLU-1C/B		4,5	Ripple pairs	2,500	0.73 M	0	26	
73-14	2 Mar 73	CBU-30/A	11	3,4,5 6	Captive compatibility					Negative dihedral effects at 0.83 mach.
73-15/1	8 Mar 73	CBU-30/A	11	3	Jettison single	2,000	250 KCAS	0	26	
73-15/2	8 Mar 73	CBU-30/A		6	Jettison single	2,000	250	0	45	
73-15/3	8 Mar 73	CBU-30/A		4	Jettison single	2,000	250 KCAS	0	26	
73-15/4	8 Mar 73	CBU-30/A		5	Jettison single	1,900	250 KCAS	0	45	
73-16/1	9 Mar 73	CBU-30/A	11	3	Jettison single	2,000	350 KCAS	0	45	Complete munition jettison from rack.
73-16/2	9 Mar 73	CBU-30/A		6	Jettison single	2,000	350 KCAS	0	54	
73-16/3	9 Mar 73	CBU-30/A		4	Jettison single	2,000	350 KCAS	0	45	
73-16/4	9 Mar 73	CBU-30/A		5	Jettison single	2,000	350 KCAS	0	54	
73-17/1	13 Mar 73	CBU-30/A	11	3	Jettison single	3,000	450 KCAS	0	45	Complete munition jettison from rack.
73-17/2	13 Mar 73	CBU-30/A		6	Jettison single	2,000	450 KCAS	0	54	

73-17/3	13 Mar 73	CBU-30/A		4	Jettison single	3,000	450 KCAS	0	45	
73-17/4	13 Mar 73	CBU-30/A		5	Jettison single	2,000	450 KCAS	0	54	
73-18/1	14 Mar 73	CBU-30/A	12	3	Jettison single	2,000	450 KCAS	0	45	Complete munition jettison from rack.
73-18/2	14 Mar 73	CBU-30/A		6	Jettison single	2,000	450 KCAS	0	54	
73-19/1	15 Mar 73	CBU-30/A	11	3	Jettison single	1,300	0.80 M	0	45	Complete munition jettison from rack.
73-19/2	15 Mar 73	CBU-30/A		6	Jettison single	2,000	0.80 M	0	54	
73-19/3	15 Mar 73	CBU-30/A		4	Jettison single	1,900	0.80 M	0	45	
73-19/4	15 Mar 73	CBU-30/A		5	Jettison single	2,050	0.80 M	0	54	Munition broke up shortly after release.
73-20/1	21 Mar 73	SUU-13	12	3	Jettison single	2,000	0.6 M 385 KCAS	0	26	Empty dispenser; i.e., no munitions.
73-20/2	21 Mar 73	SUU-13		6	Jettison single	2,000	0.6 M 385 KCAS	0	45	
73-21/1	22 Mar 73	SUU-13	12	3	Jettison single	2,000	450 KCAS	0	45	Empty dispenser
73-22, 23	27 Mar 73	CBU-38B/A	11	3	Captive compatibility					Negative dihedral effects at 0.8 mach.
73-24, 25	10 Apr 73	MK 82 SE	3		Captive compatibility					Revised arming configurations.
73-26/1	11 Apr 73	MK 82 SE	3	3, 6	Ripple pairs	3,000	0.6 M	0	45	Revised arming configurations 250 ms.
73-26/2	11 Apr 73	MK 82 SE		4, 5	Ripple pairs	3,000	0.7 M 500 KCAS	0	45	Fin of one bomb did not open.
73-27/1	13 Apr 73	CBU-30/A	12	3	Jettison single	2,000	0.8 M 515 KCAS	0	45	Complete munition jettison from rack.
73-27/2	13 Apr 73	CBU-30/A		6	Jettison single	2,000	515 KCAS	0	54	
73-28/1	17 Apr 73	MK 82 SE	3	3, 6	Ripple pairs	3,000	0.6 M 500 KCAS	0	45	Revised arming configuration.
73-28/2	17 Apr 73	MK 82 SE		3	Single	3,000	0.6 M 380 KCAS	0	45	Single release, BRU station 1, aircraft station 3.
73-28/3	17 Apr 73	MK 82 SE		3, 6	Ripple pairs	3,000	0.6 M 380 KCAS	0	45	Dropped remaining 11 MK 82 SEs, stations 3 and 6.

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
73-28/4	17 Apr 73	MK 82 SE		4,5	Ripple pairs	3,100	0.8 M 500 KCAS	0	45	250 ms
73-29/1	9 May 73	CBU-30/A	14	3	Jettison single	2,000	350 KCAS	0	45	Complete munition jettison from rack.
73-29/2	9 May 73	CBU-30/A		6	Jettison single	2,100	350 KCAS	0	54	
73-30	10 May 73	MK 82 SE	4	3,6	Captive compatibility					Revised arming configuration.
73-31	10 May 73	MK 82 SE	4	3,6	Captive compatibility					Fin release lanyard on BRU station 5 broke.
73-32/1	15 May 73	CBU-30/A	14	3	Jettison single	2,000	457 KCAS	0	45	Complete munition jettison from rack.
73-32/2	15 May 73	CBU-30/A		6	Jettison single	2,000	455 KCAS	0	54	
73-33/1	16 May 73	CBU-30/A	14	3	Jettison single	2,000	512 KCAS	0	45	Complete munition jettison from rack.
73-33/2	16 May 73	CBU-30/A		6	Jettison single	2,000	512 KCAS	0	54	
73-34/1	22 May 73	CBU-38B/A	11	3	Dispense single	1,000	455 KCAS	0	54	25 ms
73-34/2	22 May 73	CBU-38B/A		6	Dispense single	1,000	505 KCAS	0	54	
73-34/3	22 May 73	CBU-38B/A		4,5	Dispense pairs	1,000	445 KCAS	0	54	
73-34/4	22 May 73	SUU-13 dipenser	11	3	Jettison single	2,000	385 KCAS	0	26	Empty dispenser.
73-34/5	22 May 73	SUU-13 dispenser		6	Jettison single	2,000	385 KCAS	0	45	
73-34/6	22 May 73	SUU-13 dispenser		4	Jettison single	2,000	385 KCAS	0	26	
73-34/7	22 May 73	SUU-13 dispenser		5	Jettison single	2,000	385 KCAS	0	45	
73-35/1	24 May 73	CBU-38B/A	11	3	Dispense single	1,000	550 KCAS	0	54	25 ms
73-35/2	24 May 73	CBU-38B/A		6	Dispense single	1,000	595 KCAS	0	54	
73-35/3	24 May 73	SUU-13		3	Jettison single	1,325	0.70 M	0	45	Station 6 not released, CPU malfunctioned.
73-36/2	30 May 73	CBU-38B/A	11	4,5	Dispense pairs	1,000	0.90 M	0	54	Stations 3 and 6 not dispensed due to weather. 25 ms. Minor aircraft damage due to submunition dunnage.

73-37/1	6 Jun 73	SUU-13	12	3	Jettison single	1,950	512 KCAS	0	45	Empty dispenser
73-37/2	6 Jun 73	SUU-13		6	Jettison single	1,980	440 KCAS	0	54	
73-38/1	8 Jun 73	CBU-38B/A	11	4,5	Dispense pairs	7,500	540 KCAS	33	54	25 ms. Submunition dunnage impacted the aircraft.
73-38/2	8 Jun 73	CBU-38B/A		3	Dispense single	7,600	517 KCAS	31	54	
73-38/3	8 Jun 73	CBU-38B/A		6	Dispense single	5,000	563 KCAS	37	54	
73-38/4	8 Jun 73	SUU-13		3	Jettison single	1,000	0.70 M	0	54	Empty dispenser.
73-38/5	8 Jun 73	SUU-13		4	Jettison single	1,475	0.70 M	0	54	Empty dispenser.
73-38/6	8 Jun 73	SUU-13		5	Jettison single	1,450	0.70 M	0	45	Empty dispenser.
73-38/7	8 Jun 73	SUU-13		6	Jettison single	1,300	0.80 M	0	54	Empty dispenser
73-39/1	26 Jun 73	CBU-38B/A	11	3,6	Dispense pairs	7,000	0.90 M	45	54	25 ms
73-39/2	26 Jun 73	CBU-38B/A		4,5	Dispense pairs	1,000	500 KCAS	0	54	
73-40/1	28 Jun 73	CBU-38B/A	13	4,5	Dispense pairs	6,000	550 KCAS	43	54	Station 4 did not dispense; station 5, five tubes did not dispense. Submunition dunnage impacted the aircraft.
73-41/1	29 Jun 73	SUU-13	11	3	Jettison single	2,200	0.8 M 510 KCAS	0	45	Empty dispenser.
73-41/2	29 Jun 73	SUU-13		6	Jettison single	2,000	0.8 M 510 KCAS	0	54	
73-41/3	29 Jun 73	SUU-13		5	Jettison single	2,075	0.8 M 510 KCAS	0	45	
73-41/4	29 Jun 73	SUU-13		4	Jettison single	1,975	0.8 M 510 KCAS	0	54	
73-42/1	2 Jul 73	SUU-13	14	3	Jettison single	2,000	0.60 M	0	45	Empty dispenser.
73-42/2	2 Jul 73	SUU-13		6	Jettison single	2,000	0.60 M	0	54	
73-43/1	3 Jul 73	SUU-13	14	3	Jettison single	2,020	0.70 M	0	54	Empty dispenser.
73-44/1	11 Jul 73	SUU-13	14	6	Jettison single	2,000	0.80 M	0	45	Empty dispenser.

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
73-44/2	11 Jul 73	SUU-13		3	Jettison single	2,000	0.80 M	0	54	
73-45	25 Jul 73	MK 82 SE	4	3, 6	Captive compatibility					Revised arming configuration. New lanyard scuffed side of fin.
73-46	25 Jul 73	MK 82 SE	4	3, 6	Captive compatibility					Revised arming configuration.
73-47	28 Aug 73	MK 82 SE	3		Captive compatibility					Revised arming configuration. Seven FMU-54 arming lanyards were frayed.
73-48, 49	20 Nov 73	MK 82 SE	3		Captive compatibility					Revised arming configuration. Fin release wires damaged.
73-50	5 Dec 73	B-61 VFA	26	5	Captive - vibration environment					
73-51	6 Dec 73	B-61 VFA	26	5	Captive - vibration environment					
73-52	7 Dec 73	MK 32 SE	4		Captive compatibility					Fin release lanyard on station 3, BRU station 5, nearly broken. Revised arming configuration.
73-53/1	14 Dec 73	MK 84 LDGP	11	3	Single	5,000	0.75 M	0	45	allistics.
73-53/2	14 Dec 73	MK 84 LDGP		6	Single	5,100	0.75 M	0	45	
73-53/3	14 Dec 73	MK 84 LDGP		4	Single	5,000	0.75 M	0	45	
73-53/4	14 Dec 73	MK 84 LDGP		5	Single	5,100	0.75 M	0	45	
74-01/1	4 Jan 74	600 gal tank/MK 84	19	2, 7	Captive compatibility					
74-01/2	4 Jan 74	600-gal tank/MK 84		2	Single	15,000	342 KCAS/ 0.675 M	0	26	
74-02/1	8 Jan 74	600-gal tank/MK 84	19	7	Single	15,000	337 K/ 0.665 M	0	26	
74-03	10 Jan 74	MK 82 SE	4	3, 6	Captive compatibility					Revised arming lanyard configuration
74-04	17 Jan 74	MK 82 SE	3		Captive compatibility					Revised arming lanyard configuration
74-05	18 Jan 74	MK 82 SE	3		Captive compatibility					Revised arming lanyard configuration
74-06/1	21 Jan 74	MK 82 SE	3	3, 6	Jettison pairs	3,000	0.3 M	0	45	Revised arming configuration
74-06/2	21 Jan 74	MK 82 SE		4, 5	Jettison pairs	3,000	500	0	45	
74-07/1	4 Feb 74	MK 82 SE	3	3, 6	Jettison pairs	3,000	0.8 M	0	45	Station 6 would not release.
74-08	5 Feb 74	B-57 VFA	26	5	Captive - vibration environment					

74-09	6 Feb 74	B-57 VFA	26	5	Captive - vibration environment					
74-10	7 Feb 74	B-61 VFA	26	5	Captive - vibration environment					
74-11/1	8 Feb 74	MK 82 SE	1	3, 6	Pairs	4,100	0.8 M	0	45	Revised arming configuration.
74-11/2	8 Feb 74	MK 82 SE		4, 5	Pairs	4,000	0.8 M	0	45	
74-12/1	20 Feb 74	MK 84 LDGP	11	3	Single	14,800	1.05 M	0	54	Ballistics
74-12/2	20 Feb 74	MK 84 LDGP		6	Single	15,000	1.04 M	0	54	
74-12/3	20 Feb 74	MK 84 LDGP		4	Single	14,800	1.05 M	0	54	
74-12/4	20 Feb 74	MK 84 LDGP		5	Single	15,000	1.05 M	0	54	
74-13/1	21 Feb 74	MK 84 LDGP	11	3	Single	4,900	0.9 M	0	45	Ballistics
74-13/2	21 Feb 74	MK 84 LDGP		6	Single	4,750	0.9 M	0	45	
74-13/3	21 Feb 74	MK 84 LDGP		4	Single	4,900	0.9 M	0	45	
74-13/4	21 Feb 74	MK 84 LDGP		5	Single	4,900	0.9 M	0	45	
74-14/1	22 Feb 74	MK 84	11	3	Single	24,300	1.17 M	0	54	Ballistics
74-14/2	22 Feb 74	MK 84		6	Single	24,400	1.17 M	0	54	
74-14/3	22 Feb 74	MK 84		4	Single	24,400	1.15 M	0	54	
74-14/4	22 Feb 74	MK 84		5	Single	24,450	1.15 M	0	54	
74-15/1	26 Feb 74	600-gal tank (empty) MK 84	19	2, 7	Captive compatibility					
74-15/2	26 Feb 74	600-gal tank (empty) MK 84		2				0 5 Alpha		Tank would not release from station 2
74-16/1	27 Feb 74	600-gal tank (empty) MK 84	19	2	Single	15,000	338 K/ 0.66 M	0 5 Alpha	26	Normal release and separation. Tank only.
74-17/1	28 Feb 74	MK 84 LDGP	11	3	Single	15,000	1.15 M	0	54	Ballistics
75-18/1	1 Mar 74	600-gal tank (empty) MK 84	19	2	Single	10,000	390 K/ 0.7 M	0 3.9 Alpha	26	Normal release and separation. Tank only.
74-19/1	15 Mar 74	600-gal tank (empty) MK 84	19	2	Single	5,000	430 K/ 0.71 M	0 3.2 Alpha	26	

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
74-20/1	18 Mar 74	600-gal tank (empty) MK 82 SE	20	2, 7	Captive compatibility					
74-20/2	18 Mar 74	600-gal tank (empty)		2	Single	20, 000	230 K/ 0.5 M	0 10 Alpha	26	Normal release and separation. Tank only
74-21/1	21 Mar 74	600-gal tank (empty) MK 82 SE	20	2	Single	5, 000	400 K/ 0.665 M	0 3.6 Alpha	26	Normal release and separation. Tank only
74-22/1	22 Mar 74	MK 84 LDGP	11	3	Single	15, 000	0.9 M	0	45	Ballistics
74-22/2	22 Mar 74	MK 84 LDGP		6	Single	15, 000	0.9 M	0	45	
74-22/3	22 Mar 74	MK 84 LDGP		4	Single	15, 000	0.9 M	0	45	
74-22/4	22 Mar 74	MK 84 LDGP		5	Single	15, 000	0.9 M	0	45	
74-23/1	1 Apr 74	MK 82 SE	3	3, 6	Pairs	3, 000	0.8 M	0	45	Revision arming configuration.
74-23/2	1 Apr 74	MK 82 SE	3	4, 5	Pairs	3, 000	0.8 M	0	45	
74-24/1	3 Apr 74	MK 82 SE	8	4	Single	500	400 KCAS	0	45	Revised arming configuration
74-24/2	3 Apr 74	MK 82 SE		5	Single	500	400 KCAS	0	45	
74-24/3	3 Apr 74	MK 82 SE		4	Single	500	400 KCAS	0	45	
74-24/4	3 Apr 74	MK 82 SE		5	Single	500	400 KCAS	0	45	
74-24/5	3 Apr 74	MK 82 SE		4	Single	500	500 KCAS	0	45	
74-24/6	3 Apr 74	MK 82 SE		5	Single	500	500 KCAS	0	45	
74-24/7	3 Apr 74	MK 82 SE		4	Single	500	500 KCAS	0	45	
74-24/8	3 Apr 74	MK 82 SE		5	Single	500	500 KCAS	0	45	
74-25/1	5 Apr 74	BDU-33B/B	13	4	Single	5, 000	0.9 M	0	45	SUU-20B/A. Ballistics.
74-25/2	5 Apr 74	BDU-33B/B		4	Single	5, 200	0.91 M	0	45	

74-25/3	5 Apr 74	BDU-33B/B	13	4	Single	5,100	0.91 M	0	45	
74-25/4	5 Apr 74	BDU-33B/B		4	Single	9,700	0.9 M	0	45	
74-25/5	5 Apr 74	BDU-33B/B		4	Single	9,900	0.91 M	0	45	
74-26/6	5 Apr 74	BDU-33B/B		4	Single	9,900	0.9 M	0	45	
74-25/7	5 Apr 74	BDU-33B/B		5	Single	9,800	1.05 M	0	54	
74-25/8	5 Apr 74	BDU-33B/B		5	Single	5,100	1.05 M	0	54	
74-26/1	16 Apr 74	MK 84 LDGP	11	3	Single		---	---	---	Bomb would not release. Had to be jettisoned.
74-26/2	16 Apr 74	MK 84 LDGP		6	Single	5,500	1.06 M	0	54	Ballistics.
74-26/3	16 Apr 74	MK 84 LDGP		4	Single	5,100	1.06 M	0	54	
74-27/1	25 Apr 74	Fixed pylon with MAU-12 rack	12	2	Single	3,000	500 KCAS 0.8 M	0	54	Normal release/separation of fixed pylon in presence of MK 82
74-28/1	26 Apr 74	Fixed pylon	22	2	Single	3,000	500 KCAS 0.8 M	0	26	Normal release/separation of fixed pylon in presence of MK 82
74-28/2	26 Apr 74	Fixed pylon		7	Single	3,000	500 KCAS 0.8 M	0	26	Normal release/separation of fixed pylon in presence of MK 82
74-29	9 May 74	B-43 VFA	26	5	Captive - vibration environment					
74-30	9 May 74	B-43 VFA	26	5	Captive - vibration environment					
74-31	24 May 74	Aero heat								Test AFATWG01
74-32	31 May 74	B-43 TCLU	23	LWB	Captive - vibration environment					
74-33	31 May 74	Aero heat								Test AFATWG01
74-34	1 Jun 74	B-43 TCLU	25	LWB	Captive - vibration environment					BDU-8 right weapons bay. B-43 TCLU left weapons bay.
74-35	5 Jun 74	Aero heat								Test AFATWG01
74-36	5 Jun 74	Aero heat								Test AFATWG01
74-37	19 Jun 74	AIM-9J	28		Captive compatibility					
74-38	20 Jun 74	AIM-9J	28		Captive compatibility					
74-39	21 Jun 74	AIM-9J	28		Captive compatibility					All missiles sustained damage. Damage was due to known missile defects, not captive environment.
74-40/1	11 Jul 74	BDU-33B/B	12	3	Single	10,000	1.05 M	0	60	SUU-20B/A. Ballistics.
74-40/2	11 Jul 74	BDU-33B/B		3	Single	9,900	1.05 M	0	60	
74-40/3	11 Jul 74	BDU-33B/B		6	Single	10,000	1.05 M	0	60	
74-40/4	11 Jul 74	BDU-33B/B		6	Single	10,000	1.05 M	0	60	
74-40/5	11 Jul 74	BDU-33B/B		6	Single	5,000	1.04 M	0	60	
74-40/6	11 Jul 74	BDU-33B/B		6	Single	5,000	1.05 M	0	60	
74-41/1	12 Jul 74	BDU-33B/B	12	3	Single	10,000	0.90 M	0	45	SUU-20B/A. Ballistics.
74-41/2	12 Jul 74	BDU-33B/B		3	Single	10,000	0.90 M	0	45	
74-41/3	12 Jul 74	BDU-33B/B		3	Single	10,000	0.90 M	0	45	
74-41/4	12 Jul 74	BDU-33B/B		6	Single	5,000	0.90 M	0	60	
74-41/5	12 Jul 74	BDU-33B/B		6	Single	4,950	0.90 M	0	45	
74-41/6	12 Jul 74	BDU-33B/B		6	Single	5,000	0.90 M	0	45	

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Table 2. (Continued)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
74-42/1	16 Jul 74	BDU-33B/B	12	3	Single	300	550 KTAS	20 Loft	54	SUU-20B/A. Ballistics.
74-42/2	16 Jul 74	BDU-33B/B		3	Single	300	550 KTAS	20 Loft	54	
74-42/3	16 Jul 74	BDU-33B/B		3	Single	300	550 KTAS	20 Loft	54	
74-42/4	16 Jul 74	BDU-33B/B		6	Single	300	550 KTAS	30 Loft	54	
74-42/5	16 Jul 74	BDU-33B/B		6	Single	300	550 KTAS	30 Loft	54	
74-42/6	16 Jul 74	BDU-33B/B		6	Single	300	550 KTAS	30 Loft	54	
74-43/1	17 Jul 74	BDU-33B/B	12	3	Single	3,100	0.80 M	30	45	SUU-20B/A. Ballistics.
74-43/2	17 Jul 74	BDU-33B/B		3	Single	2,700	0.80 M	30	45	
74-44/3	17 Jul 74	BDU-33B/B		3	Single	2,900	0.80 M	30	45	
74-44/1	18 Jul 74	BDU-33B/B	12	3	Single	19,600	1.15 M	30	60	SUU-20B/A. Ballistics.
74-44/2	18 Jul 74	BDU-33B/B		3	Single	19,700	1.15 M	30	60	
74-44/3	18 Jul 74	BDU-33B/B		3	Single	20,100	1.15 M	30	60	
74-44/4	18 Jul 74	BDU-33B/B		6	Single	25,000	1.26 M	30	60	
74-44/5	18 Jul 74	BDU-33B/B		6	Single	25,000	1.27 M	30	60	
74-44/6	18 Jul 74	BDU-33B/B		6	Single	25,000	1.24 M	30	60	
74-45/1	19 Jul 74	BDU-33B/B	12	3	Single	3,000	0.8 M	15	45	SUU-20B/A. Ballistics.
74-45/2	19 Jul 74	BDU-33B/B		3	Single	2,900	0.8 M	15	45	
74-45/3	19 Jul 74	BDU-33B/B		3	Single	3,200	0.8 M	15	45	
74-46/1	26 Jul 74	CBU-58	5	Captive compatibility						Horizontal oscillations of the BRU/ store combination occurred between 0.92 to 0.94 mach. Test 5613W001
74-47/1	13 Aug 74	BDU-33B/B	13	4	Single	10,000	1.04 M	0	60	SUU-20B/A. Ballistics.
74-47/2	13 Aug 74	BDU-33B/B		4	Single	10,000	1.05 M	0	60	
74-47/3	13 Aug 74	BDU-33B/B		4	Single	10,000	1.05 M	0	60	
74-48	22 Aug 74	Aero heat								Test AFATWG01
74-49	22 Aug 74	Aero heat								Test AFATWG01
74-50	23 Aug 74	CBU-58	5	Captive compatibility						Horizontal oscillations of the BRU/ store combination occurred between 0.93 to 0.94 mach. Test 5613W001
74-51/1	5 Sep 74	BDU-33B/B	12	3	Single	5,000	1.04 M	0	60	SUU-20B/A. Ballistics.
74-51/2	5 Sep 74	BDU-33B/B		3	Single	5,000	1.04 M	0	60	
74-51/3	5 Sep 74	BDU-33B/B		3	Single	4,950	1.04 M	0	60	
74-51/4	5 Sep 74	BDU-33B/B		3	Single	4,800	1.02 M	0	60	
74-51/5	5 Sep 74	BDU-33B/B		3	Single	4,900	1.04 M	0	60	
74-52/1	10 Sep 74	BDU-33B/B	13	4	Single	21,000	1.15 M	0	60	SUU-20B/A. Ballistics.

74-52/2	10 Sep 74	BDU-33B/B	13	4	Single	20,500	1.15 M	0	60	
74-52/3	10 Sep 74	BDU-33B/B		4	Single	19,900	1.15 M	0	60	
74-52/4	10 Sep 74	BDU-33B/B		4	Single	25,800	1.23 M	0	60	
74-52/5	10 Sep 74	BDU-33B/B		4	Single	24,950	1.23 M	0	60	
74-53	30 Sep 74	B-47 VFA	24	LWB	Captive - vibrational environment					
74-54	2 Oct 74	B-61 VFA	24	LWB	Captive - vibrational environment					
74-55	3 Oct 74	B-43 VFA	24	LWB	Captive - vibrational environment					
74-56/1	4 Nov 74	MK 82 SE	3	3,6	Ripple pairs	3,000	500 KCAS	0	45	Revised arming configuration. Thirteen bombs malfunctioned.
74-56/2	4 Nov 74	MK 82 SE		4,5	Ripple pairs	3,000	500 KCAS	0	45	
74-57/1	14 Nov 74	MK 84 LDGP	11	3	Single	25,000	1.20 M	0	60	Ballistics
74-57/2	14 Nov 74	MK 84 LDGP		6	Single	25,000	1.23 M	0	60	
74-57/3	14 Nov 74	MK 84 LDGP		4,5	Pairs	25,000	1.28 M	0	60	
74-58/1	15 Nov 74	MK 84 LDGP	10	3	Single	5,000	1.03 M	0	54	Ballistics
74-58/2	15 Nov 74	MK 84 LDGP		4	Single	5,000	1.05 M	0	54	
74-58/3	15 Nov 74	MK 84 LDGP		5	Single	5,200	1.05 M	0	54	
74-59	18 Nov 74	B-57 VFA	24	LWB	Captive - vibration environment					QRC-335A ECM pod on forward station.
74-60	19 Nov 74	B-61 VFA	24	LWB	Captive - vibration environment					QRC-335A ECM pod on forward station.
74-61	19 Nov 74	B-61 VFA	26	5	Captive - vibration environment					QRC-335A ECM pod on forward station.
74-62	21 Nov 74	B-61 VFA	26	5	Captive - vibration environment					QRC-335A ECM pod on forward station.
74-63	21 Nov 74	B-43 VFA	27	LWB	Captive - vibration environment					QRC-335A ECM pod on forward station.
75-01	23 Jan 75	Aero heat								Test AFATWG01
75-02	23 Jan 75	Aero heat								Test AFATWG01
75-03	24 Jan 75	Aero heat								Test AFATWG01
75-04	25 Jan 75	Aero heat								Test AFATWG01
75-05	25 Jan 75	Aero heat								Test AFATWG01
75-06	26 Jan 75	Aero heat								Test AFATWG01
75-07	26 Jan 75	Aero heat								Test AFATWG01
75-08	27 Jan 75	Aero heat								Test AFATWG01
75-09	27 Jan 75	Aero heat								Test AFATWG01
75-10	28 Jan 75	Aero heat								Test AFATWG01
75-11	10 Mar 75	BDU-8/B	24	LWB	Single	1,000	500 KCAS	0	40	QRC-335A ECM pod on forward station.

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Table 2. (Concluded)

Mission no./ pass no.	Date	Munition	Configuration	Release conditions						Remarks
				Station	Mode	Altitude	Airspeed	Dive angle (deg)	Wing sweep (deg)	
75-13	14 Mar 75	BDU-8/B	24	LWB	Single	1,000	550 KCAS	0	54	QRC-335A ECM pod on forward station. BDU-8/B pitched nose up.
75-14	17 Mar 75	BDU-8/B	24	LWB	Single	1,000	550 KCAS	0	54	QRC-335A ECM pod on forward station. Repeat of 75-13, orifice changed from 7,4 to 7,6. Good separation.
75-15	20 Mar 75	BDU-8/B	24	LWB	Single	1,000	600 KCAS	0	54	QRC-335A ECM pod on forward station.
75-16/1	21 Mar 75	BDU-33B/A	12	6	Single	950	530 KCAS	20	54	SUU-20B/A. Ballistics.
75-16/2	21 Mar 75	BDU-33B/A		6	Single	950	535 KCAS	20	54	
75-16/3	21 Mar 75	BDU-33B/A		6	Single	850	525 KCAS	20	54	
75-16/4	21 Mar 75	BDU-33B/A		6	Single	1,000	550 KCAS	20	54	
75-16/5	21 Mar 75	BDU-33B/A		6	Single	900	535 KCAS	20	54	
75-16/6	21 Mar 75	BDU-33B/A		3	Single	1,000	535 KCAS	20	54	
75-17	25 Mar 75	BDU-8/B	24	LWB	Single	6,700	1.03 M	0	72	QRC-335A ECM pod on forward station.
75-18	7 Apr 75	BDU-8/B	24	LWB	Single	18,000	1.10 M	0	72	QRC-335A ECM pod on forward station.
75-19	15 Apr 75	BDU-8/B	24	LWB	Single	23,000	1.20 M	0	72	QRC-335A ECM pod on forward station.
75-20/1	17 Apr 75	BDU-33B/A	12	6	Single	4,000	550 KCAS	0	54	SUU-20B/A. Ballistics.
75-20/2	17 Apr 75	BDU-33B/A		6	Single	4,000	550 KCAS	0	54	
75-20/3	17 Apr 75	BDU-33B/A		3	Single	4,000	550 KCAS	0	54	
75-20/4	17 Apr 75	BDU-33B/A		3	Single	4,000	550 KCAS	0	54	
75-20/5	17 Apr 75	BDU-33B/A		3	Single	4,000	550 KCAS	0	54	
75-20/6	17 Apr 75	BDU-33B/A		3	Single	4,000	550 KCAS	0	54	
75-20/7	17 Apr 75	BDU-33B/A		3	Single	4,000	550 KCAS	0	54	
75-20/8	17 Apr 75	BDU-33B/A		3	Single	4,000	550 KCAS	0	54	

75-26	17 Oct 75	M117	1		Captive compatibility					Severe oscillations
76-01	15 Jan 76	GBU-10	11		Captive compatibility					Test 3169WC02
76-02	15 Jan 76	GBU-10	11		Captive compatibility					Test 3169WC02
76-03/1	16 Jan 76	GBU-10	12	3	Single	4,000	0.80 M	0	45	Test 3169WC02
76-03/2	16 Jan 76	GBU-10		6	Single	4,000	0.85 M	0	54	Test 3169WC02
76-04/1	21 Jan 76	GBU-10	12	3	Single	5,000	0.90 M	0	54	Test 3169WC02
76-05/1	23 Jan 76	GBU-10	30	3	Single	9,200	0.955 M	0	54	Test 3169WC02
76-06	1 Apr 76	CBU-58/ FMU-110	5	6	Ripple pairs			0		Weapon system malfunction. BRU rack dropped. Test ADTCWC13.
76-07	16 Apr 76	CBU-58/ FMU-110	5	3, 6	Ripple	2,800	500 KCAS	0	45	50 ms. Test ADTCWC13.
76-08	13 May 76	M117	29		Captive compatibility					Oscillations
76-09	21 May 76	GBU-2	11		Captive compatibility					Test 5974W002
76-10	3 Jun 76	GBU-2	11		Captive compatibility					Test 5974W002
76-11	3 Jun 76	GBU-2	11		Captive compatibility					
76-12	8 Jun 76	MK 82	5		Captive compatibility					
76-13	9 Jun 76	MK 82	5		Captive compatibility					
76-14	9 Jun 76	MK 82	5		Captive compatibility					
76-15	17 Jun 76	GBU-2	15	4	Single	8,000	0.85 M 550 KCAS	0		Test 5974W002
76-16	17 Jun 76	MK 82 SE	3							Aircraft instrumentation malfunction. No releases.
76-17	18 Jun 76	GBU-2	15							Aircraft instrumentation malfunction. No releases. Test 5974W002.

SECTION IV

SUMMARY OF FINDINGS

FIT

The following anomalies were discovered during fit checks on the F-111:

1. A 12-inch retention cable was required for the CBU-30/A (CBU-38B/A) electrical harness.

2. The aft lug required backing off up to one turn in order to load the MK 20 on the forward shoulder stations of the BRU-3 rack.

3. A tail fin arming device was required on each station of the BRU-3 rack to insure positive fin opening of the MK 20 during release.

CARRIAGE

Flight carriage of all munitions configurations was acceptable except for the following:

1. Based on negative dihedral characteristics, CBU-30/A (CBU-38B/A) configurations were restricted to a 0.80-mach limit for a 26-degree wing sweep and a 0.85-mach limit for a 35-degree wing sweep.

2. Pending certification flights using airworthy AIM-9J guidance units and rollerons, the AIM-9J was restricted from flight on the F-111.

3. The flight envelope of the CBU-58 in configuration 5 of Table 1 remained restricted to 0.9 mach.

4. Between airspeeds of 400 to 460 KCAS and wing sweeps of 26 to 45 degrees, the BRU-3A/A racks with 16 or more heavy stores were restricted from carriage at bank angles of more than 60 degrees. In this flight regime, abrupt lateral control inputs were prohibited.

SEPARATION

Very minor aircraft damage was experienced from the dunnage associated with the BLU-49 submunition (CBU-38B/A) when dispensed at 0.90 mach from aircraft stations 4 and 5.

BDU-8 separations from the left side of the weapons bay in the presence of the forward QRC pod required orifice settings of -7 forward and -6 aft in order to avoid store pitchup.

BALLISTICS

Due to small test item size, only partial ballistics data were obtained for BDU-33B/B practice bombs released above 5,000 feet.

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